

LEGEND

DISPENSER ISLANDS

HYDRAULIC HOIST

CLARIFIER

APPROXIMATE LATERAL EXTENT OF GASOLINE-IMPACTED SOIL TPH CARBON RANGE (C4-C12) >100 PPM

APPROXIMATE LATERAL EXTENT OF DIESEL AND HEAVY-END HYDROCARBON-IMPACTED SOIL TPH >1,000 PPM AT A DEPTH OF ONE FOOT BGS

APPROXIMATE LATERAL EXTENT OF DIESEL AND HEAVY-END HYDROCARBON-IMPACTED SOIL TPH >1,000 PPM AT A DEPTH OF 11 FEET BGS

GEOPROBE BORING LOCATION SHOWING TOTAL TPH (C4-C40) CONCENTRATIONS (PPM)

HOLLOW-STEM AUGER BORING LOCATION

GROUNDWATER RESULTS

TPH - (C4-C12) - PPM

VOCs - PPM

NOTE: DEPTH TO GROUNDWATER - 102.3' BGS AS MEASURED ON FEBRUARY 6, 2004

B1 (GROUNDWATER)

TPH - 0.895

B - 0.6

T - 35.5

E - 27.7

X - 232.3

MTBE - 14.6

SOIL RESULTS - TPH (C4-C12); PPM

B1	B2	B3	B4
32'-41.3	20'-ND	45'-ND	10'-ND
45'-13,800	30'-ND	55'-2.63	40'-60.9
50'-562	40'-ND	65'-ND	45'-1,840
55'-24,300			55'-1.86
60'-1,590			65'-ND
65'-1,640			75'-ND
75'-624			
85'-2.02	B5	B6	
95'-ND	20'-ND	40'-ND	
105'-ND	52'-1.24	50'-3.49	
	60'-139	60'-0.889	
	70'-ND	70'-1.18	

TASK				SUBSURFACE INVESTIGATION			
TITLE				SITE PLAN			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 15'	DRAWN	SJF	APPROVED	VH	REVISED	3-11-04
DATE	9-24-03	SHEET	1 OF 1	DRAWING NUMBER	10902202B		
EP ASSOCIATES 1111 N. BRAND BLVD., SUITE 405 GLENDALE, CA 91202-3023 TEL (818) 246-4499 FAX (818) 246-4362				FIGURE 2			

Table 1
Summary of Analytical Results of Soil Samples
UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				BTEX & Oxygenates, MTBE, TBA, DIPE, ETBE, TAME (8260B) (ug/kg)	VOCs by Method 8260B (ug/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)		
MW-6 @ 105'	ND	ND	ND	ND	ND	ND
MW-7 @ 105'	ND	ND	ND	ND	ND	ND
MW-8 @ 105'	ND	ND	ND	ND	ND	ND
MW-9 @ 100'	ND	ND	ND	ND	ND	ND

mg/kg = milligrams per kilogram; ug/kg = micrograms per kilogram; ND = not detected (see Appendix E for laboratory Method Detection Limits)

Table 2
Results of Detected CAM Metals
UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California
(Units = mg/kg)

Constituent	Sample MW-6 @ 55'	Sample MW-7 @ 105'	Sample MW-8 @ 105'	Sample MW-9 @ 100'	TTLc mg/kg	STLC mg/l
Arsenic	2.40	ND	ND	ND	500	5
Barium	121	120	86.5	61.0	10,000	100
Chromium	15.1	13.7	8.30	10.2	2,500	560
Cobalt	11.4	10.8	7.60	5.55	8,000	80
Copper	17.6	19.0	11.5	9.95	2,500	25
Nickel	9.0	9.0	5.45	4.75	2,000	20
Vanadium	43.5	43.3	32.3	23.5	2,400	24
Zinc	62.0	56.0	38.6	29.1	5,000	250

mg/kg = milligrams per kilogram; TTLc = Total Threshold Limit Concentration; STLC = Soluble Threshold Limit Concentration; mg/l = milligrams per liter; ND = not detected (see Appendix E for laboratory Method Detection Limits)

TABLE II
Summary of Analytical Results of Soil Samples - Hollow-Stem Auger Borings
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				Benzene (B), Toluene (T), Ethylbenzene (E), Total Xylenes (X) & Oxygenates = MTBE, TBA, DIPE, ETBE, TAME, Ethanol (8260B) (ug/kg) ; & Organic Lead (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)	
B1-5'	--	--	--	--	--
B1-10'	--	--	--	--	--
B1-15'	--	--	--	--	--
B1-20'	--	--	--	--	--
B1-25'	--	--	--	--	--
B1-32'	41.3	ND	ND	41.3	X-118.5
B1-40'	--	--	--	--	--
B1-45'	13,800	514	ND	14,314	T - 1,170,000 E - 671,000 X - 4,150,000
B1-50'	562	39.2	ND	601.2	T - 16,900 E - 19,200 X - 145,900
B1-55'	24,300	563	ND	24,863	B - 75,3000 Organic Lead = ND T - 1,870,000 E - 672,000 X - 3,900,000
B1-60'	1,590	88.5	20.5	1,699	--
B1-65'	0.640	ND	ND	0.640	--
B1-75'	0.624	ND	ND	0.624	--
B1-85'	2.02	ND	ND	2.02	--
B1-95'	ND	ND	ND	ND	--
B1-105'	ND	ND	ND	ND	MTBE - 5.4
B2-20'	ND	ND	ND	ND	ND
B2-25'	--	--	--	--	--
B2-30'	ND	ND	ND	ND	ND
B2-35'	--	--	--	--	--
B2-40'	ND	ND	ND	ND	ND
B3-12'	--	--	--	--	--
B3-15'	--	--	--	--	--
B3-20'	--	--	--	--	--
B3-25'	--	--	--	--	--
B3-30'	--	--	--	--	--
B3-35'	--	--	--	--	--
B3-40'	--	--	--	--	--

mg/kg (milligrams per kilogram) or parts per million (ppm)
 ug/kg (micrograms per kilogram) or parts per billion (ppb)
 ND = not detected; -- = not analyzed

TABLE II (continued)
Summary of Analytical Results of Soil Samples - Hollow-Stem Auger Borings
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				Benzene (B), Toluene (T), Ethylbenzene (E), Total Xylenes (X) & Oxygenates = MTBE, TBA, DIPF, ETBE, TAME, Ethanol (8260B) (ug/kg) ; & Organic Lead (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)	
B3-45'	ND	ND	ND	ND	X - 5.5
B3-50'	--	--	--	--	--
B3-55'	2.63	ND	ND	2.63	B - 26.3 T - 405 E - 70.3 X - 572 MTBE - 326 TBA - 181
B3-60'	--	--	--	--	--
B3-65'	ND	ND	ND	ND	MTBE - 26.5
B4-10'	ND	ND	ND	ND	--
B4-20'	--	--	--	--	--
B4-30'	--	--	--	--	--
B4-40'	60.9	19.6	ND	80.5	T - 51.5 X - 68.0
B4-45'	1,840	146	ND	1,986	T - 35,000 E - 54,700 X - 473,000
B4-50'	--	--	--	--	--
B4-55'	1.86	ND	ND	1.86	B - 118 T - 861 E - 141 X - 976 MTBE - 646
B4-60'	--	--	--	--	--
B4-65'	ND	ND	ND	ND	T - 5.6 MTBE - 160
B4-70'	--	--	--	--	--
B4-75'	ND	ND	ND	ND	MTBE - 33.3
B5-20'	ND	ND	ND	ND	--
B5-30'	--	--	--	--	--
B5-40'	--	--	--	--	--

mg/kg (milligrams per kilogram) or parts per million (ppm)

ug/kg (micrograms per kilogram) or parts per billion (ppb)

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TABLE II (continued)
Summary of Analytical Results of Soil Samples - Hollow-Stem Auger Borings

UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				Benzene (B), Toluene (T), Ethylbenzene (E), Total Xylenes (X) & Oxygenates = MTBE, TBA, DIPE, ETBE, TAME, Ethanol (8260B) (ug/kg) ; & Organic Lead (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)	
B5-52'	1.24	ND	ND	1.24	T - 34.6 E - 9.5 X - 94.9 MTBE - 49.5 TBA - 66.8
B5-55'	--	--	--	--	--
B5-60'	139	9.7	ND	148.7	T - 3,870 E - 3,760 X - 25,530
B5-65'	--	--	--	--	--
B5-70'	ND	ND	ND	ND	MTBE - 17.7
B6-20'	--	--	--	--	--
B6-30'	--	--	--	--	--
B6-40'	ND	ND	ND	ND	ND
B6-50'	3.49	ND	ND	3.49	T - 245 E - 239 X - 1,927
B6-55'	--	--	--	--	--
B6-60'	0.669	ND	ND	0.669	T - 17.5 E - 17.7 X - 138 MTBE - 16.0
B6-65'	--	--	--	--	--
B6-70'	1.18	ND	ND	1.18	MTBE - 13.1

mg/kg (milligrams per kilogram) or parts per million (ppm)
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TABLE III
Summary of Analytical Results of Soil Samples - Geoprobe Borings
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				VOCs 8260B (ug/kg) ppb	CAM Metals (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)		
GP1-1'	--	--	--	--	ND	--
GP1-6'	--	--	--	--	ND	--
GP1-11'	--	--	--	--	--	--
GP2-1'	--	--	--	--	--	--
GP2-6'	--	--	--	--	--	--
GP2-11'	--	ND	ND	ND	--	--
GP3-1'	--	--	--	--	--	--
GP3-6'	--	--	--	--	--	--
GP3-11'	ND	10.8	21.2	32.0	ND	**
GP3-16'	--	--	--	--	ND	**
GP4-1'	--	--	--	--	--	--
GP4-6'	--	--	--	--	--	--
GP4-11'	ND	ND	ND	ND	ND	**
GP4-16'	--	--	--	--	ND	--
GP5-1'	--	--	--	--	--	--
GP5-6'	--	--	--	--	--	--
GP5-11'	ND	64.3	1,160	1,224.3	ND	**
GP5-16'	--	37.2	897	934.2	ND	--
GP6-1'	ND	ND	ND	ND	--	--
GP6-6'	--	--	--	--	--	--
GP6-11'	--	--	--	--	--	--
GP6-16'	--	--	--	--	--	--
GP6-21'	ND	ND	ND	ND	--	--
GP6-26'	--	--	--	--	--	--
GP7-1'	ND	ND	ND	ND	--	--
GP7-6'	--	--	--	--	--	--
GP7-11'	--	--	--	--	--	--
GP7-16'	--	--	--	--	--	--
GP7-21'	ND	ND	ND	ND	--	--
GP7-26'	--	--	--	--	--	--
GP8-1'	ND	ND	ND	ND	--	--
GP8-6'	--	--	--	--	--	--
GP8-11'	--	--	--	--	--	--

mg/kg (milligrams per kilogram) or parts per million (ppm)

ug/kg (micrograms per kilogram) or parts per billion (ppb)

ND = not detected; -- = not analyzed

** See Table V for CAM Metals Results

TABLE III (continued)
Summary of Analytical Results of Soil Samples - Geoprobe Borings
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				VOCs 8260B (ug/kg) ppb	CAM Metals (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH Diesel and Oil		
GP8-16'	--	--	--	--	--	--
GP8-21'	ND	ND	ND	ND	--	--
GP8-26'	--	--	--	--	--	--
GP9-1'	ND	ND	ND	ND	--	--
GP9-6'	--	--	--	--	--	--
GP9-11'	--	--	--	--	--	--
GP10-1'	ND	ND	ND	ND	--	--
GP10-6'	--	--	--	--	--	--
GP10-11'	--	--	--	--	--	--
GP11-1'	ND	ND	ND	ND	--	--
GP11-6'	--	--	--	--	--	--
GP11-11'	--	--	--	--	--	--
GP12-1'	ND	389	4,220	4,609	--	--
GP12-6'	--	ND	9.5	9.5	--	--
GP12-11'	--	--	--	--	--	--
GP13-1'	ND	ND	377	377	--	--
GP13-6'	--	--	--	--	--	--
GP13-11'	--	--	--	--	--	--
GP14-1'	ND	ND	ND	ND	--	--
GP14-6'	--	--	--	--	--	--
GP14-11'	--	--	--	--	--	--
GP15-1'	ND	54.1	1,160	1,214.1	--	--
GP15-6'	--	ND	21.6	21.6	--	--
GP15-11'	--	--	--	--	--	--
GP16-1'	ND	ND	ND	ND	--	--
GP16-6'	--	--	--	--	--	--

mg/kg (milligrams per kilogram) or parts per million (ppm)

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TABLE III (continued)
Summary of Analytical Results of Soil Samples - Geoprobe Borings
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				VOCs 8260B (ug/kg)	CAM Metals (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH Diesel and Oil		
GP16-11'	ND	ND	ND	ND	--	--
GP16-16'	--	--	--	--	--	--
B16-21'	--	--	--	--	--	--
GP17-1'	ND	380	3,780	4,160	--	--
GP17-6'	--	ND	ND	ND	--	--
GP17-11'	ND	ND	ND	ND	--	--
GP17-16'	--	--	--	--	--	--
GP17-21'	--	--	--	--	--	--
GP18-1'	ND	ND	ND	ND	--	--
GP18-6'	--	--	--	--	--	--
GP18-11'	ND	ND	ND	ND	--	--
GP18-16'	--	--	--	--	--	--
GP18-21'	--	--	--	--	--	--
GP19-1'	ND	357	3,850	4,207	--	--
GP19-6'	--	ND	39.3	39.3	--	--
GP19-11'	ND	ND	23.2	23.2	--	--
GP19-16'	--	--	--	--	--	--
GP19-21'	--	--	--	--	--	--
GP20-1'	--	--	--	--	--	--
GP20-6'	--	--	--	--	--	--
GP20-11'	ND	ND	ND	ND	ND	**
GP20-16'	--	--	--	--	--	--
GP21-1'	ND	ND	34.1	34.1	--	--
GP21-6'	--	--	--	--	--	--
GP21-11'	ND	ND	ND	ND	--	--
GP21-16'	--	--	--	--	--	--
GP21-21'	--	--	--	--	--	--
GP22-1'	ND	377	2,870	3,247	--	--
GP22-6'	--	--	--	--	--	--
GP22-11'	ND	ND	ND	ND	--	--
GP22-16'	--	--	--	--	--	--

mg/kg (milligrams per kilogram) or parts per million (ppm)
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** See Table V for CAM Metals results

TABLE III (continued)
Summary of Analytical Results of Soil Samples - Geoprobe Borings
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				VOCs 8260B (ug/kg) ppb	CAM Metals (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)		
GP22-21'	--	--	--	--	--	--
GP23-1'	ND	56.0	793	849	--	--
GP23-6'	--	--	--	--	--	--
GP23-11'	ND	ND	ND	ND	--	--
GP23-16'	--	--	--	--	--	--
GP23-21'	--	--	--	--	--	--
GP24-1'	ND	118	1,330	1,448	--	--
GP24-6'	--	--	--	--	--	--
GP24-11'	ND	ND	ND	ND	--	--
GP24-16'	--	--	--	--	--	--
GP24-21'	--	--	--	--	--	--
GP25-1'	ND	318	2,240	2,558	--	--
GP25-6'	--	--	--	--	--	--
GP25-11'	ND	ND	ND	ND	--	--
GP25-16'	--	--	--	--	--	--
GP25-21'	--	--	--	--	--	--
GP26-1'	ND	116	1,080	1,196	--	--
GP26-6'	--	--	--	--	--	--
GP26-11'	ND	ND	20.6	20.6	--	--
GP26-16'	--	--	--	--	--	--
GP26-21'	--	--	--	--	--	--
GP27-1'	ND	ND	ND	ND	--	--
GP27-6'	--	--	--	--	--	--
GP27-11'	ND	80.8	1,230	1,310.8	--	--
GP27-16'	--	ND	ND	ND	--	--
GP27-21'	--	ND	ND	ND	--	--
GP28-1'	ND	ND	11.9	11.9	--	--
GP28-6'	--	--	--	--	--	--
GP28-11'	ND	ND	168	168	--	--
GP28-16'	--	--	--	--	--	--
GP28-21'	--	--	--	--	--	--

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TABLE III (continued)
Summary of Analytical Results of Soil Samples - Geoprobe Borings
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California















Sample No.	8015M (mg/kg) ppm				VOCs 8260B (ug/kg) ppb	CAM Metals (ug/kg) ppb
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)		
GP29-1'	ND	ND	ND	ND	--	--
GP29-6'	--	--	--	--	--	--
GP29-11'	--	--	--	--	--	--
GP29-16'	ND	ND	13.0	13.0	--	--
GP30-1'	ND	15.6	453	468.6	--	--
GP30-6'	--	--	--	--	--	--
GP30-11'	--	--	--	--	--	--
GP30-16'	--	--	--	--	--	--
GP30-21'	ND	ND	ND	ND	--	--
GP31-1'	ND	ND	35.5	35.5	--	--
GP31-6'	--	--	--	--	--	--
GP31-11'	--	--	--	--	--	--
GP31-16'	--	--	--	--	--	--
GP31-21'	ND	ND	ND	ND	--	--
GP32-1'	ND	ND	14.4	14.4	--	--
GP32-6'	--	--	--	--	--	--
GP32-11'	--	--	--	--	--	--
GP32-16'	--	--	--	--	--	--
GP32-21'	ND	ND	ND	ND	--	--
GP33-1'	ND	ND	ND	ND	--	--
GP33-6'	--	--	--	--	--	--
GP33-11'	--	--	--	--	--	--
GP33-16'	--	--	--	--	--	--
GP33-21'	ND	ND	8.9	8.9	--	--
GP34-1'	ND	ND	7.5	7.5	--	--
GP34-6'	--	--	--	--	--	--
GP34-11'	--	--	--	--	--	--
GP34-16'	--	--	--	--	--	--
GP34-21'	ND	ND	ND	ND	--	--
GP35-1'	ND	ND	ND	ND	--	--
GP35-6'	--	--	--	--	--	--
GP35-11'	ND	ND	ND	ND	--	--








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TABLE III (continued)
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 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				VOCs 8260B (ug/kg) ppb	CAM Metals (mg/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)		
GP36-1'	--	--	--	--	--	--
GP36-6'	ND	ND	ND	ND	ND	--
GP36-11'	--	--	--	--	--	--
GP37-1'	ND	ND	ND	ND	--	--
GP37-6'	--	--	--	--	--	--
GP37-11'	--	--	--	--	--	--
GP38-1'	ND	ND	ND	ND	--	--
GP38-6'	--	--	--	--	--	--
GP38-11'	--	--	--	--	--	--
GP39-1'	ND	ND	ND	ND	--	--
GP39-6'	--	--	--	--	--	--
GP39-11'	--	--	--	--	--	--
GP40-1'	ND	42.5	888	930	--	--
GP40-6'	--	ND	ND	ND	--	--
GP40-11'	--	--	--	--	--	--
GP41-1'	ND	12.1	100	112	--	--
GP41-6'	--	--	--	--	--	--
GP41-11'	--	--	--	--	--	--
GP42-1'	ND	35.9	527	563	--	--
GP42-6'	--	--	--	--	--	--
GP42-11'	--	--	--	--	--	--
GP43-1'	ND	ND	ND	ND	--	--
GP43-6'	--	--	--	--	--	--
GP43-11'	--	--	--	--	--	--
GP44-3'	--	--	--	--	--	--
GP44-9'	ND	ND	ND	ND	ND	--
GP44-14'	660	641	8.4	1,309.4	Xylenes = 1,430	--
GP44-19'	--	--	--	--	--	--
GP44-24'	ND	ND	ND	ND	ND	--
GP45-5'	ND	ND	ND	ND	ND	--
GP46-20'	--	--	--	--	--	--
GP46-30'	ND	ND	ND	ND	ND	--
GP47-20'	ND	ND	ND	ND	--	--
GP48-20'	ND	ND	ND	ND	--	--

mg/kg (milligrams per kilogram) or parts per million (ppm); ug/kg (micrograms per kilogram) or parts per billion (ppb)

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVEL WITH OVER 12% FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL-GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE-GRAINED SOIL MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, L. CLAYS
			OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
	HIGHLY ORGANIC SOILS		PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

-  - "UNDISTURBED" SPLIT-SPOON OR SHELBY TUBE SAMPLE
-  - BULK OR CLASSIFICATION SAMPLE
-  - STANDARD PENETRATION TEST SAMPLE
-  - NO SAMPLE RECOVERED
-  - CORE SAMPLE
-  - DEPTH TO FIRST GROUND WATER ENCOUNTERED
-  - DEPTH TO STABILIZED GROUND WATER

HC ODOR - HYDROCARBON ODOR

NO - NO ODOR
LO - SLIGHT ODOR
MD - MODERATE ODOR
SG - STRONG ODOR

VOC (PPM) - VOLATILE ORGANIC COMPOUND VAPOR CONCENTRATIONS IN PARTS PER MILLION DETECTED BY PHOTOIONIZATION DETECTOR OR ORGANIC VAPOR ANALYZER

BLOWS/6" - BLOWS REQUIRED TO DRIVE SAMPLER 6 INCHES WITH A 140-POUND HAMMER FALLING 30 INCHES



EP ASSOCIATES
1111 NORTH BRAND BOULEVARD, SUITE 405
GLENDALE, CALIFORNIA 91202-3023
TEL. (818) 246-4699 FAX. (818) 246-4362

PROJECT NO.: 10902202

NAME & LOCATION:
UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA

KEY TO BORING LOG

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT.	SAMPLE	GRAPHIC LOG	U S C S	DESCRIPTION
	NO							6" concrete FILL - sand and pea gravel
25.3	NO	4 5 4		5				FILL - sand and pea gravel
36.8	NO	4 3 4		10				FILL - sand and pea gravel
22.0	LO	7 11 16		15			SM	SAND/SILTY SAND, light brown, mostly fine sand, some medium to coarse sand, dense, damp,
22.0	LO	49 50 3"		20			SW	SAND, brown, fine to coarse with some fine gravel, dense
28.4	LO	25 28 50		25			SW	SAND, light brown, fine to coarse sand with 10% fine to coarse gravel, large rock to 2", dense, damp
								Augers grinding @ 28'
								No recovery @ 30'
26.9	SG	60 5"					SW	SAND, gray-brown, fine to coarse sand with fine gravel, very dense
								No recovery @ 35'
		100 5"		35				No recovery @ 37'
		100 3"						



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GLENDALE, CALIFORNIA 91202
TEL: (818) 246-4499 FAX: (818) 246-4362

PROJECT NO. 10902202
NAME & LOCATION: UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA
LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 02-03-04

BORING NO. BI

PAGE: 1 OF 3
ELEVATION: 571'
EQUIPMENT: HOLLOW-STEM
DRILLED BY: PROSONIC

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	GRAPHIC LOG	U S C S	DESCRIPTION
502	SG	48 50 3"		40			SW	SAND, light yellow-brown, mostly fine sand with some fine gravel, dense, dry
2,302	SG	42 50 5"		45			SW	- same
938	SG	50		50			SW	- same, light brown, more coarse gravel
9,999	SG	25 50 5"		55			SW SM	SAND/SILTY SAND, light brown, mostly fine sand, some medium to coarse sand, dense, damp.
1,854	SG	24 50		60			SM	SILTY SAND, light yellow-brown, with some coarse sand and fine gravel, dense, dry
1,526	SG	35 50 5"		65			SW SM	SAND, light brown, fine to coarse sand with 10% fine to coarse gravel, large rock to 2", dense, damp Ended drilling on 2-3-04 @ 65' Started drilling @ 65' on 2-4-04
733	MD	20 40 50 3"		75			SP	SAND, light yellow-brown, mostly fine, well sorted, dense



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PROJECT NO. 10902202
NAME & LOCATION: UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA

LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 02-04-04

BORING NO.

BI

PAGE: 2 OF 3
ELEVATION: 571'
EQUIPMENT: HOLLOW-STEM
DRILLED BY: PROSONIC

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	GRAPHIC LOG	U S C S	DESCRIPTION
25.3	LO	63		80				
				85			SW	SAND, tan, fine to coarse, moderate sorting, dense
				90				
11.5	LO	15 50		95			SM	SILTY SAND, medium brown, fine sand, stiff, moist End drilling on 2-4-04 @ 95' Start drilling on 2-5-04
				100				
	LO	11 50 5"		105			SW	SAND, light brown, fine to coarse sand and gravel, poorly sorted, dense, saturated
				110				
				115				End of boring @ 115' bgs; Encountered groundwater at approxi- mately 105' bgs; Drilled to 115' bgs to allow groundwater to collect in boring; Collected grab groundwater sample with dispo- sable bailer in 2 VOAs. Groundwater was measured @ 102.3' bgs on 2-6-04.



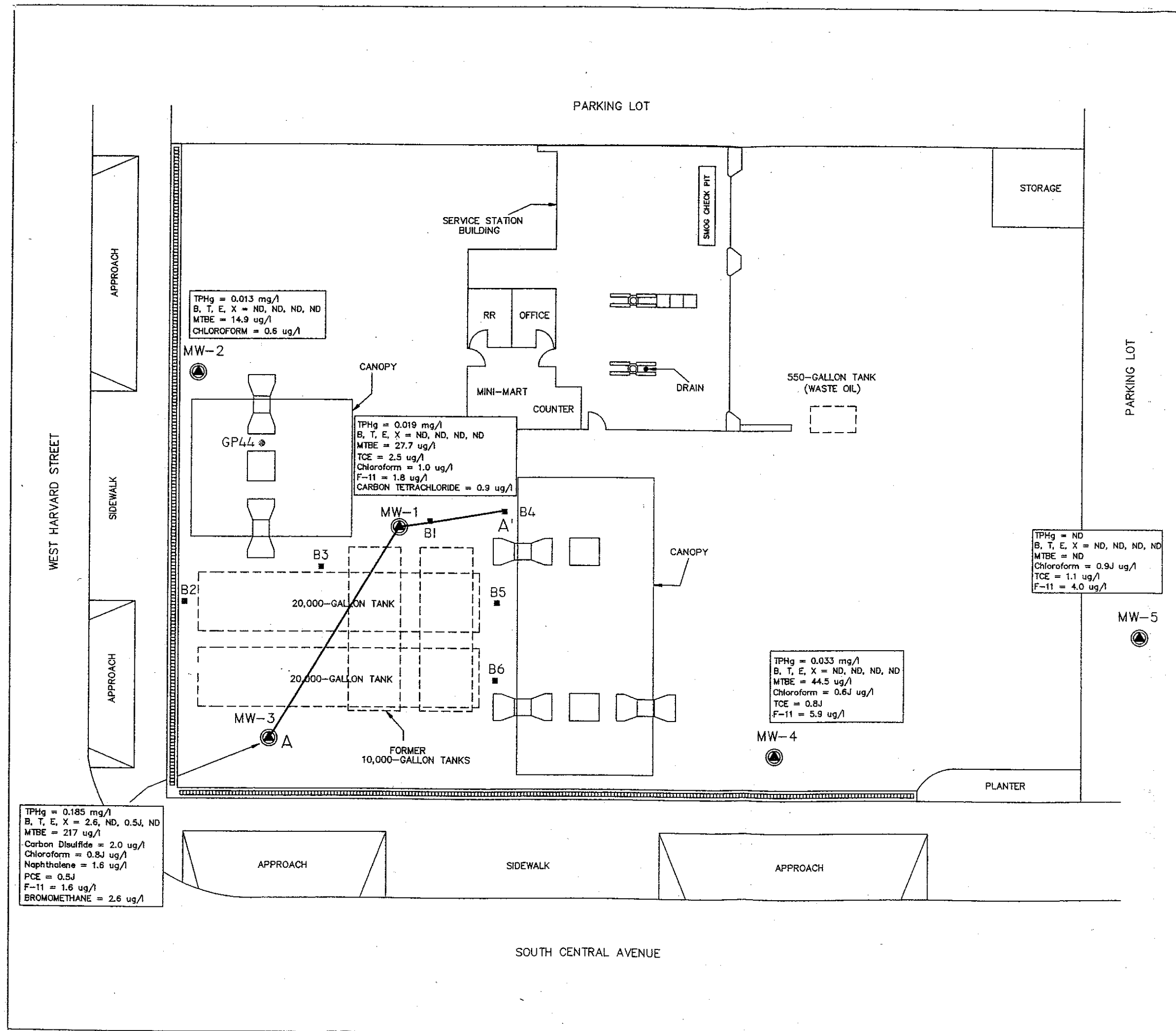
EP ASSOCIATES
111 NORTH BRAND BOULEVARD, SUITE 405
GLENDALE, CALIFORNIA 91202
TEL: (818) 246-4499 FAX: (818) 246-4562

PROJECT NO. 10902202
NAME & LOCATION: UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA

LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 02-05-04

BORING NO. B1

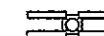
PAGE: 3 OF 3
ELEVATION: 571'
EQUIPMENT: HOLLOW-STEM
DRILLED BY: PROSONIC



LEGEND



DISPENSER ISLANDS



HYDRAULIC HOIST



CLARIFIER

BI



LOCATION OF BORING B1 (2/6/04)

TPHg = 0.013 mg/l
B, T, E, X = ND, ND, ND, ND
MTBE = 14.9 ug/l
CHLOROFORM = 0.6 ug/l

MW-2



LOCATION OF MONITORING WELL MW-2
AND GROUNDWATER SAMPLE RESULTS

GP44



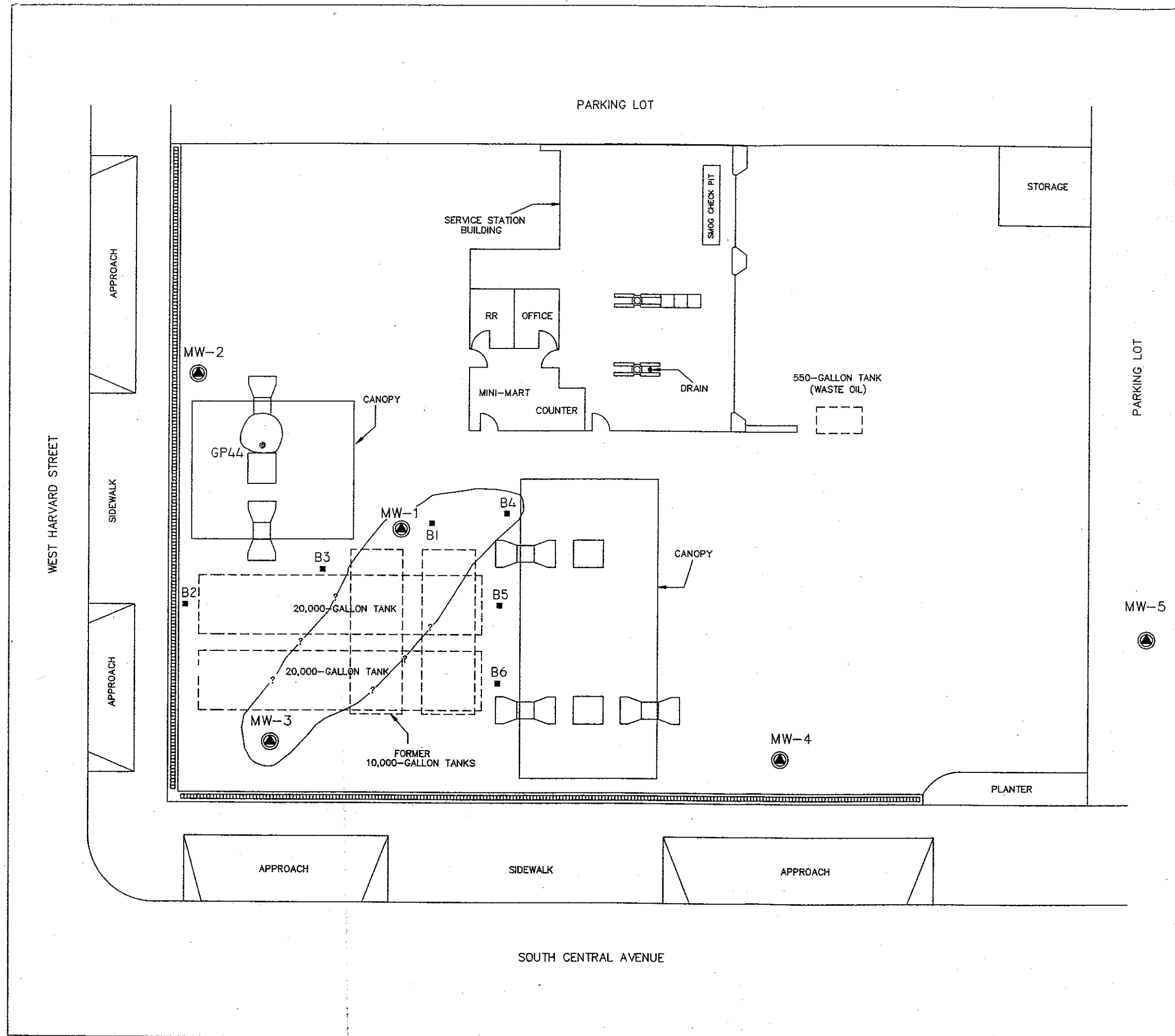
LOCATION OF GEOPROBE BORING GP44

A - A'

CROSS SECTION LINE FOR FIGURE 6



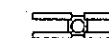
TASK				GROUNDWATER INVESTIGATION			
TITLE				SITE PLAN			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 15'	DRAWN	SJF	APPROVED	VH	REVISED	
DATE	09-29-04	SHEET	1 OF 1	DRAWING NUMBER 10902203B			
EP ASSOCIATES 1111 NORTH BRAND BOULEVARD, SUITE 405 GLENDALE, CALIFORNIA 91202-3023 TEL. (818) 246-6499 FAX. (818) 246-6362				FIGURE 2			



LEGEND



DISPENSER ISLANDS



HYDRAULIC HOIST



CLARIFIER




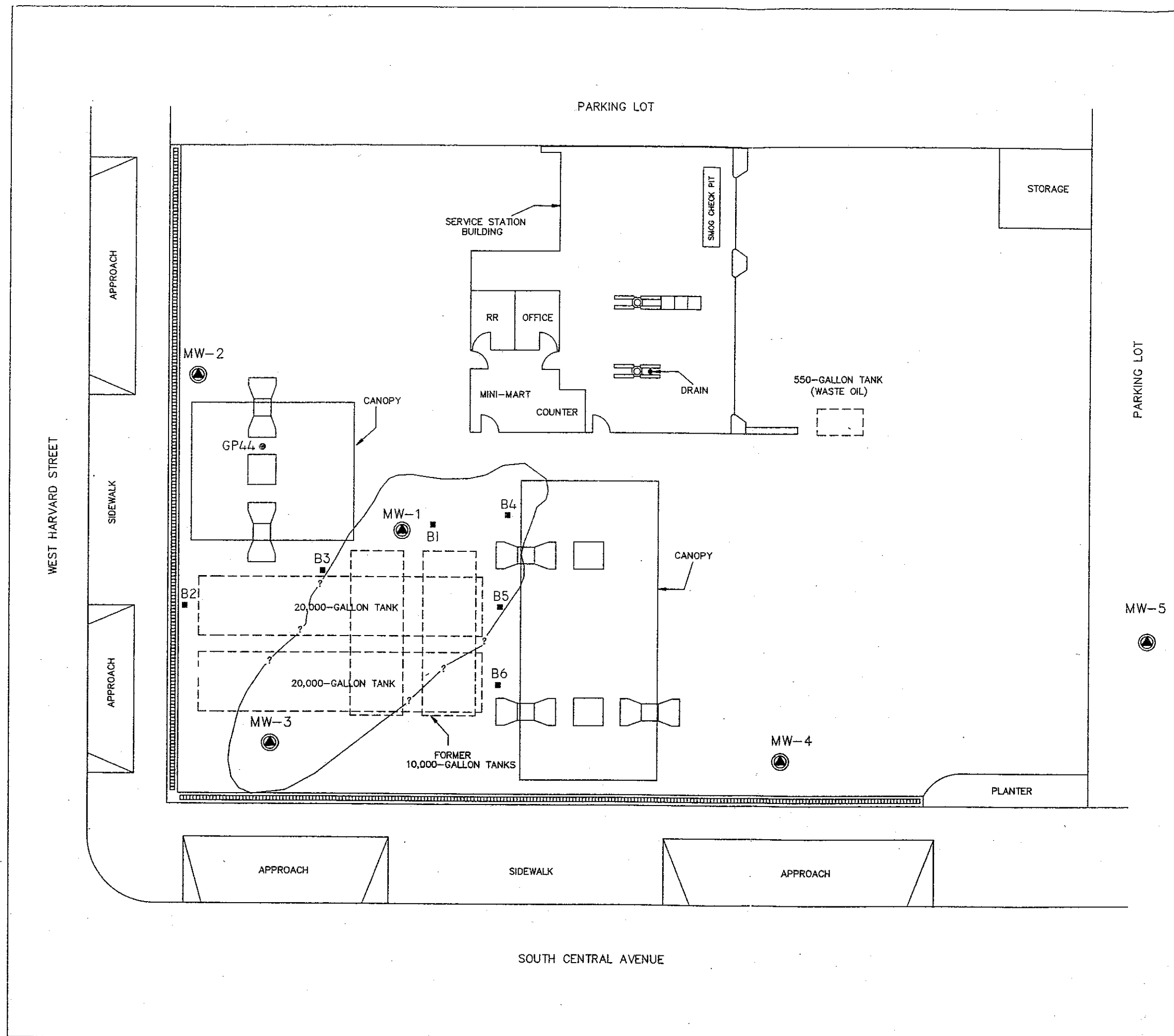
LOCATION OF BORING B1 (2/6/04)









APPROXIMATE LATERAL EXTENT OF TPHg
(>500 mg/kg) SOIL CONTAMINATION PLUME




TASK				GROUNDWATER INVESTIGATION			
TITLE				APPROXIMATE LATERAL EXTENT OF TPHg (>500 mg/kg) SOIL CONTAMINATION PLUME			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 15'	DRAWN	SJF	APPROVED	VH	REVISED	
DATE	09-29-04	SHEET	1 OF 1	DRAWING NUMBER 10902203D			
 EP ASSOCIATES 1111 NORTH BRAND BOULEVARD, SUITE 405 GLENDALE, CALIFORNIA 91202-3023 TEL. (818) 246-4499 FAX. (818) 246-4362						FIGURE 4	

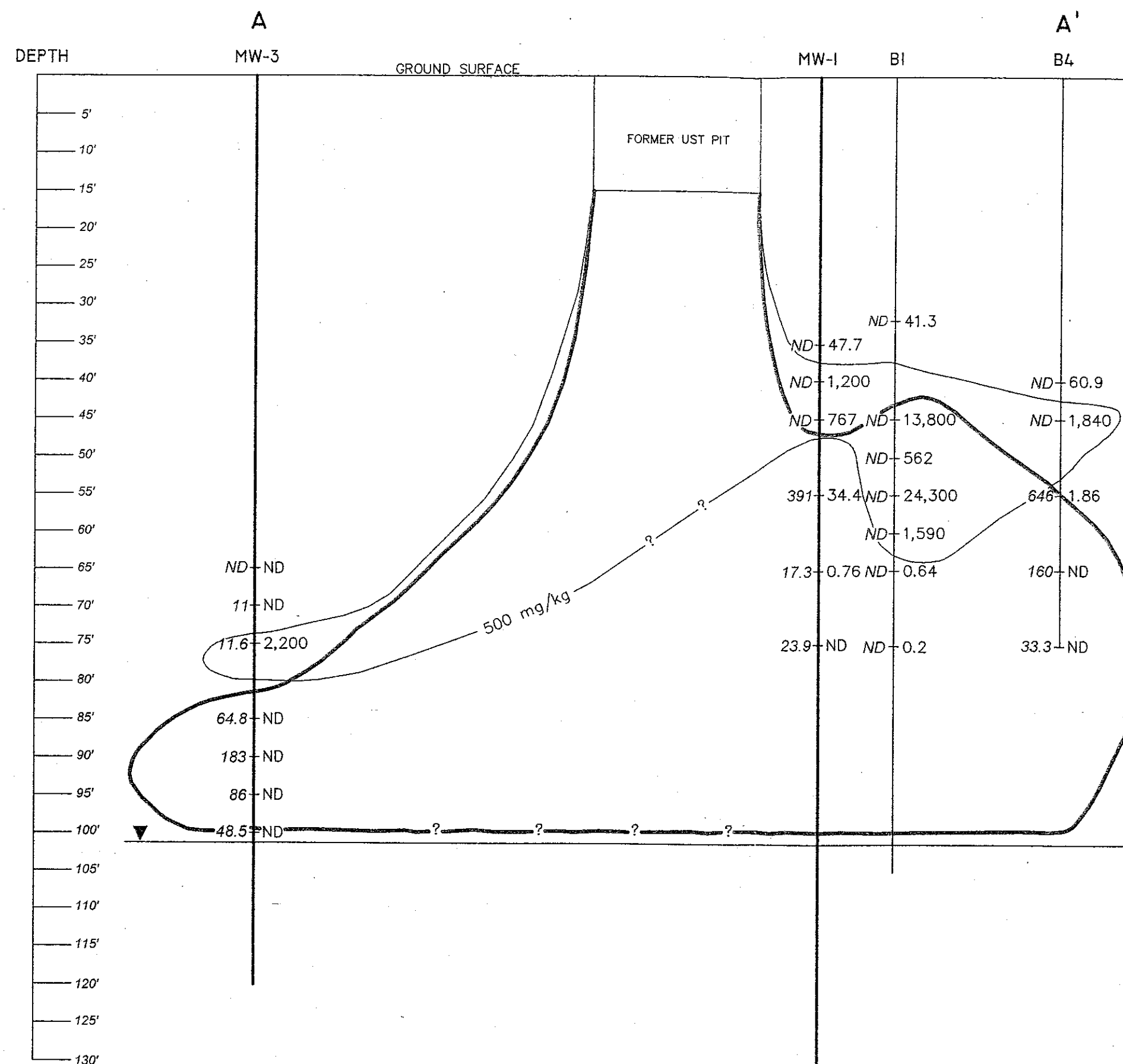


L E G E N D

-  DISPENSER ISLANDS
-  HYDRAULIC HOIST
-  CLARIFIER
-  B1
LOCATION OF BORING B1 (2/6/04)
-  MW-1 (416.12')
LOCATION OF MONITORING WELL MW-1
(GROUNDWATER ELEVATION ABOVE MSL)
-  APPROXIMATE LATERAL EXTENT OF
MTBE SOIL CONTAMINATION PLUME



TASK				GROUNDWATER INVESTIGATION			
TITLE				APPROXIMATE LATERAL EXTENT OF MTBE SOIL CONTAMINATION PLUME			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 15'	DRAWN	SJF	APPROVED	VH	REVISED	
DATE	09-29-04	SHEET	1 OF 1	DRAWING NUMBER 10902203E			
 EP ASSOCIATES 1111 NORTH GRAND BOULEVARD, SUITE 405 GLENDALE, CALIFORNIA 91202-3023 TEL. (818) 246-4499 FAX. (818) 246-4362				FIGURE 5			



LEGEND

BI LOCATION OF GEOPROBE BORING B1

ND-41.3 MTBE CONCENTRATION (NON-DETECTED)
TPHg CONCENTRATION (41.3 mg/kg)

MW-1 LOCATION OF MONITORING WELL MW-1

391-34.4 MTBE CONCENTRATION (391 ug/kg)
TPHg CONCENTRATION (34.4 mg/kg)

GROUNDWATER TABLE

A-A' CROSS SECTION A-A'

NOTES:

MTBE IN BORING B1 WAS LIKELY DELUTED OUT OF LABORATORY RESULTS OF THE SOIL SAMPLES.

HORIZONTAL SCALE: 1" = 10'

VERTICAL SCALE: 1" = 20'



TASK			
GROUNDWATER INVESTIGATION			
TITLE			
APPROXIMATE VERTICAL EXTENT OF TPHg AND MTBE SOIL CONTAMINATION			
NAME			
UNOCAL SERVICE STATION 0353			
SITE ADDRESS			
200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	DRAWN	APPROVED	REVISED
1" = 15'	SJF	VH	
DATE	SHEET	DRAWING NUMBER	
09-29-04	1 OF 1	10902203F	
EP ASSOCIATES 1111 NORTH BRAND BOULEVARD, SUITE 405 GLENDALE, CALIFORNIA 91202-3025 TEL. (818) 246-4699 FAX. (818) 246-4362			FIGURE 6

Table 1
Summary of Analytical Results of Soil Samples
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				BTEX & Oxygenates, MTBE, TBA, DIPE, ETBE, TAME (8021B/8260B) (ug/kg)	VOCs by Method 8260B (ug/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)		
MW-1 @ 35'	47.7	12.6	ND	60.3	X - 4.9	
MW-1 @ 40'	1,200	18.7	ND	1,218.7	E - 967 X - 35,900	sec-Butylbenzene - 55.5 Isopropylbenzene - 1,850 Naphthalene - 35,200 n-Propylbenzene - 3,670 1,2,4-Trimethylbenzene - 75,300 1,3,5-Trimethylbenzene - 33,300
MW-1 @ 45'	767	5.45	ND	772.45	E - 9,380 X - 81,500	sec-Butylbenzene - 1,380 Isopropylbenzene - 1,950 Naphthalene - 13,300 n-Propylbenzene - 7,570 1,2,4-Trimethylbenzene - 61,700 1,3,5-Trimethylbenzene - 18,100
MW-1 @ 55'	34.4	ND	ND	34.4 TRPH = 10.0 (by Method 418.1)	B - 116 E - 488 X - 3,670 MTBE - 391 TBA - 610	sec-Butylbenzene - 55.4 Isopropylbenzene - 77.3 Naphthalene - 585 n-Propylbenzene - 294 1,2,4-Trimethylbenzene - 2,370 1,3,5-Trimethylbenzene - 668
MW-1 @ 60'	ND	ND	ND	ND	T - 4.9 X - 7.0	Trace
MW-1 @ 65'	0.761	ND	ND	0.761	T - 28.2 E - 18.0 X - 128 MTBE - 17.3	Trace
MW-1 @ 70'	ND	ND	ND	ND	ND	ND
MW-1 @ 75'	ND	ND	ND	ND	X - 2.2 MTBE - 23.9	Trace
MW-2 @ 70'	ND	ND	ND	ND	ND	--
MW-3 @ 65'	ND	ND	ND	ND	ND	--
MW-3 @ 70'	ND	ND	ND	ND	X - 93.5 MTBE - 11.0	
MW-3 @ 75'	2,200	ND	ND	2,200	E - 5.6 X - 40.8 MTBE - 11.6	--
MW-3 @ 85'	ND	ND	ND	ND	MTBE - 64.8	--
MW-3 @ 90'	ND	ND	ND	ND	MTBE - 183	--
MW-3 @ 95'	ND	ND	ND	ND	MTBE - 86.0	--
MW-3 @ 100'	ND	ND	ND	ND	MTBE - 48.5	--
MW-4 @ 100'	ND	ND	ND	ND	ND	ND

mg/kg = milligrams per kilogram; ug/kg = micrograms per kilogram; ND = not detected; -- = not analyzed

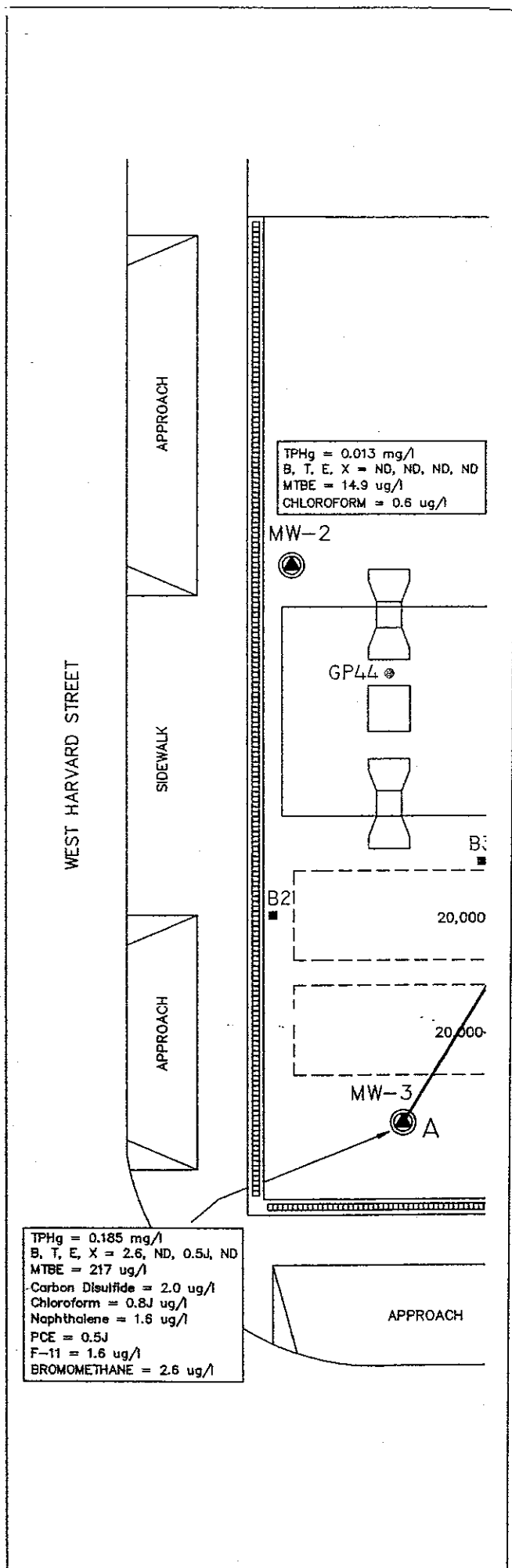
Table 2
Results of Detected CAM Metals
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California
 (Units = mg/kg)

Constituent	Sample MW-1 @ 55'
Barium	78.6
Cadmium	2.00
Chromium	9.10
Cobalt	7.80
Copper	10.7
Lead	3.90
Nickel	6.0
Vanadium	29.2
Zinc	45.1

mg/kg = milligrams per kilogram

Table 3
Summary of Groundwater Elevation Data
 UNOCAL Service Station 0353
 200 South Central Avenue, Glendale, California

Well No.	Date	Well Casing Elevation (feet above msl)	Depth to Groundwater (feet)	Static Water Elevation (feet above msl)
MW-1	9-10-04	518.789	102.7	416.12
MW-2	9-10-04	518.179	102.3	415.93
MW-3	9-10-04	517.756	101.86	415.96
MW-4	9-10-04	517.310	102.20	416.15
MW-5	9-10-04	516.647	100.63	416.08



LEGEND



DISPENSER ISLANDS



HYDRAULIC HOIST



CLARIFIER

BI



LOCATION OF BORING BI (2/6/04)

TPHg = 0.013 mg/l
B, T, E, X = ND, ND, ND, ND
MTBE = 14.9 ug/l
CHLOROFORM = 0.6 ug/l

MW-2



LOCATION OF MONITORING WELL MW-2
AND GROUNDWATER SAMPLE RESULTS

GP44



















LOCATION OF GEOPROBE BORING GP44








A - A'

CROSS SECTION LINE FOR FIGURE 6



TASK				GROUNDWATER INVESTIGATION			
TITLE				SITE PLAN			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 15'	DRAWN	SJF	APPROVED	VH	REVISED	
DATE	09-29-04	SHEET	1 OF 1	DRAWING NUMBER 10902203B			
 EP ASSOCIATES 1111 NORTH BRAND BOULEVARD, SUITE 405 GLENDALE, CALIFORNIA 91202-3023 TEL. (818) 246-4499 FAX. (818) 246-4362				FIGURE 2			

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVEL WITH OVER 12% FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL-GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE-GRAINED SOIL MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, L. CLAYS
			OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

-  - "UNDISTURBED" SPLIT-SPOON OR SHELBY TUBE SAMPLE
-  - BULK OR CLASSIFICATION SAMPLE
-  - STANDARD PENETRATION TEST SAMPLE
-  - NO SAMPLE RECOVERED
-  - CORE SAMPLE
-  - DEPTH TO FIRST GROUND WATER ENCOUNTERED
-  - DEPTH TO STABILIZED GROUND WATER

HC ODOR - HYDROCARBON ODOR

NO - NO ODOR
LO - SLIGHT ODOR
MD - MODERATE ODOR
SG - STRONG ODOR

VOC (PPM) - VOLATILE ORGANIC COMPOUND VAPOR
CONCENTRATIONS IN PARTS PER MILLION DETECTED BY
PHOTOIONIZATION DETECTOR OR ORGANIC VAPOR
ANALYZER

BLOWS/6" - BLOWS REQUIRED TO DRIVE SAMPLER
6 INCHES WITH A 140-POUND HAMMER FALLING
30 INCHES



EP ASSOCIATES
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PROJECT NO.: 10902203
NAME & LOCATION:
UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA

KEY TO BORING LOG

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	USCS	DESCRIPTION
								6" concrete
								FILL - Sand and pea gravel to approximately 15' bgs.
				10				SILTY SAND
				20				SAND, brown, fine to coarse, some fine gravel, poorly sorted, dense, damp
				30				
166	MOD	50		40			SW	SAND, brown, fine to coarse sand and gravel, dense, damp
1,324	MOD	21 50		40			SW	
1,622	SG	28 50		40			SW	
72,000	SG	50		50				NO RECOVERY AT 50'
72,000	SG	50		50			SM	SILTY SAND, brown, fine to coarse sand, some fine gravel, dense, damp
117	MOD	16 17 19		60			SW	SAND, light brown, fine to coarse, some fine gravel, dense, damp
84	MOD	50		60			SM	SILTY SAND
56	MOD	50		70			SW	SAND
38	MOD	23 50		70			SP	SAND, light brown, fine, well-sorted, 2% fine gravel, dense, damp
53				80				
37				90				SAND, light brown, fine to coarse, poorly sorted
				100				SILTY SAND
26				100				CLAYED SAND, moist
21				100				SAND, light brown, fine to coarse, poorly sorted, some fine gravel, dense, saturated
				110				SILTY SAND, fine to coarse sand, fine gravel, saturated
				120				
				130				End of boring at 130' bgs; encountered groundwater at approximately 100' bgs; used 8" augers to 100' bgs; overdrilled 11" augers from 0-130' bgs; set 4" pvc groundwater monitoring well.
				140				
				150				



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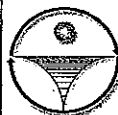
PROJECT NO. 10902203
NAME & LOCATION: UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA
LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 08/10/04 & 08/11/04

BORING NO. MW-1

PAGE: 1 OF 1
ELEVATION: 518.789' MSL
EQUIPMENT: HSA
DRILLED BY: WDC

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
								6" concrete
				10				NOTE: LOGGED ON DRILLING CUTTINGS
0	NO			20				SAND, brown, fine to coarse with fine gravel, poorly sorted, dense, damp
6.5	NO			30				GRAVELLY SAND, brown, fine to coarse sand and gravel, very poorly sorted, very dense, damp
	NO			40				
	NO			50				SAND, brown, fine to coarse, some fine gravel
	NO			60				fine to coarse gravel increase, very dense
	NO	50 6		70			SW	SAND, brown, mostly fine to medium, with some coarse sand and fine gravel, poorly sorted, dense, damp
				80				
				90				
				100				SILTY SAND, brown, some fine gravel
				110				
				120				End of boring at 120' bgs; encountered groundwater at approximately 100' bgs; used 8" augers to 100' bgs; overdrilled with 11" augers from 0-120' bgs; set 4" pvc groundwater monitoring well.
				130				
				140				
				150				



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PROJECT NO. 10902203
NAME & LOCATION: UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA
LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 08/04/04 & 08/05/04

BORING NO. MW-2

PAGE: 1 OF 1
ELEVATION: 518.179' MSL
EQUIPMENT: HSA
DRILLED BY: WDC

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
53	NO							6" concrete
85	NO			10				SAND, brown, fine to coarse with fine gravel, some fines, poorly sorted, loose, slightly damp
0	NO			20				some coarse gravel
0	NO			30				same
0	NO			40				more coarse gravel, dense
0				50				SILTY SAND, brown, with fine gravel, medium dense
0	SL			60				
0	SL	20/50		70			SW	SAND, light yellow-brown, fine to coarse, moderate sorting, dense, damp
185	MOD	50		80			SM	SILTY SAND, light brown, fine to coarse sand, fine gravel, dense, damp
7.9	SL	50		90			SP	SAND, light brown, mostly fine to medium, dense, well sorted, damp
369	SG	50		100			SM	SILTY SAND, light brown, fine to coarse, fine gravel
82.3	SL	50		110			SM	mostly fine to medium sand
136	SL	50		120			SM	some clay
130	NO	23/50		130			SW/SM	SAND/SILTY SAND, fine to coarse sand, fine gravel
104	NO	20/50		140				mostly fine to medium sand, some coarse sand and fine gravel
				150				End of boring at 120' bgs; encountered groundwater at approximately 100' bgs; used 8" augers to 100' bgs; overdrilled with 11" augers from 0-120' bgs; set 4" pvc groundwater monitoring well.



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PROJECT NO. 10902203
NAME & LOCATION: UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA

LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 08/03/04

BORING NO. MW-3

PAGE: 1 OF 1
ELEVATION: 517.756' MSL
EQUIPMENT: HSA
DRILLED BY: WDC

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
0								4" asphalt
0				10				SILTY SAND, brown, mostly fine to medium sand with approximately 3% fine to coarse gravel, medium dense, damp
0				20				SAND, brown, fine to coarse sand and gravel, some fines, medium dense, damp
0				30				GRAVELLY SAND, brown, fine to coarse sand and gravel, approximately 30% coarse gravel, poorly sorted, very dense
0				40				coarse gravel decrease
0				50				SAND, brown, mostly fine to medium with fine gravel
0				60				SILTY SAND, brown, fine to coarse, 2% fine gravel
0				70				SAND, brown, mostly fine to medium, some coarse sand and gravel, dense, damp
0				80				
0				90				some coarse gravel
0	NO	30/50	▼	100				SAND, brown, fine to coarse sand and gravel, poorly sorted, dense, moist to wet
				110				CLAYBY/SILTY SAND, saturated with fine gravel
				120				same
				130				End of boring at 120' bgs; encountered groundwater at approximately 100' bgs; used 8" augers to 100' bgs; overdrilled with 11" augers from 0-120' bgs; set 4" pvc groundwater monitoring well.
				140				
				150				
								NOTE: BORING LOG BASED ON DRILLING CUTTINGS



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PROJECT NO. 10902203
 NAME & LOCATION: UNOCAL SS 0353
 200 SOUTH CENTRAL AVENUE
 GLENDALE, CALIFORNIA
 LOGGED BY: ROBIN KIM
 QC BY: VH
 DATE: 08/06/04 & 08/09/04

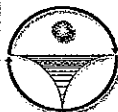
BORING NO. MW-4

PAGE: 1 OF 1
 ELEVATION: 517.310' MSL
 EQUIPMENT: HSA
 DRILLED BY: WDC

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
0	NO							3" asphalt
0	NO			10				SAND, brown, mostly fine, some coarse sand and fine gravel, moderate sorting, damp
0	NO							fine to coarse gravel increase
28.5	NO			20				gravel decrease
19.6	NO							GRAVELLY SAND, brown, fine to coarse sand and gravel, poorly sorted, dense, damp
124.0	NO			30				cobbles to 4"
93.2	NO							SAND AND GRAVEL, 50/50
105	NO			40				cobbles to 4"
36.4	NO							SAND, brown fine to coarse sand and gravel, mostly fine gravel, dense, damp
80	NO			50				
186	NO							tried to sample, but "No Recovery" at 55' bgs.
73.6	NO			60				SAND, brown, fine to coarse, some fine gravel
12.3	NO							SILTY SAND, gray-brown, fine to coarse sand, some clay
34.3	NO			70				fine gravel
53.6	NO							
73.1	NO			80				
	NO			90				SAND, gray-brown, fine to coarse with fine gravel
	NO			100				
				110				
				120				End of boring at 120' bgs; encountered groundwater at approximately 100' bgs; used 11" augers from 0-120' bgs; set 4" pvc groundwater monitoring well.
				130				
				140				
				150				

NOTE: BORING LOG BASED ON DRILLING CUTTINGS



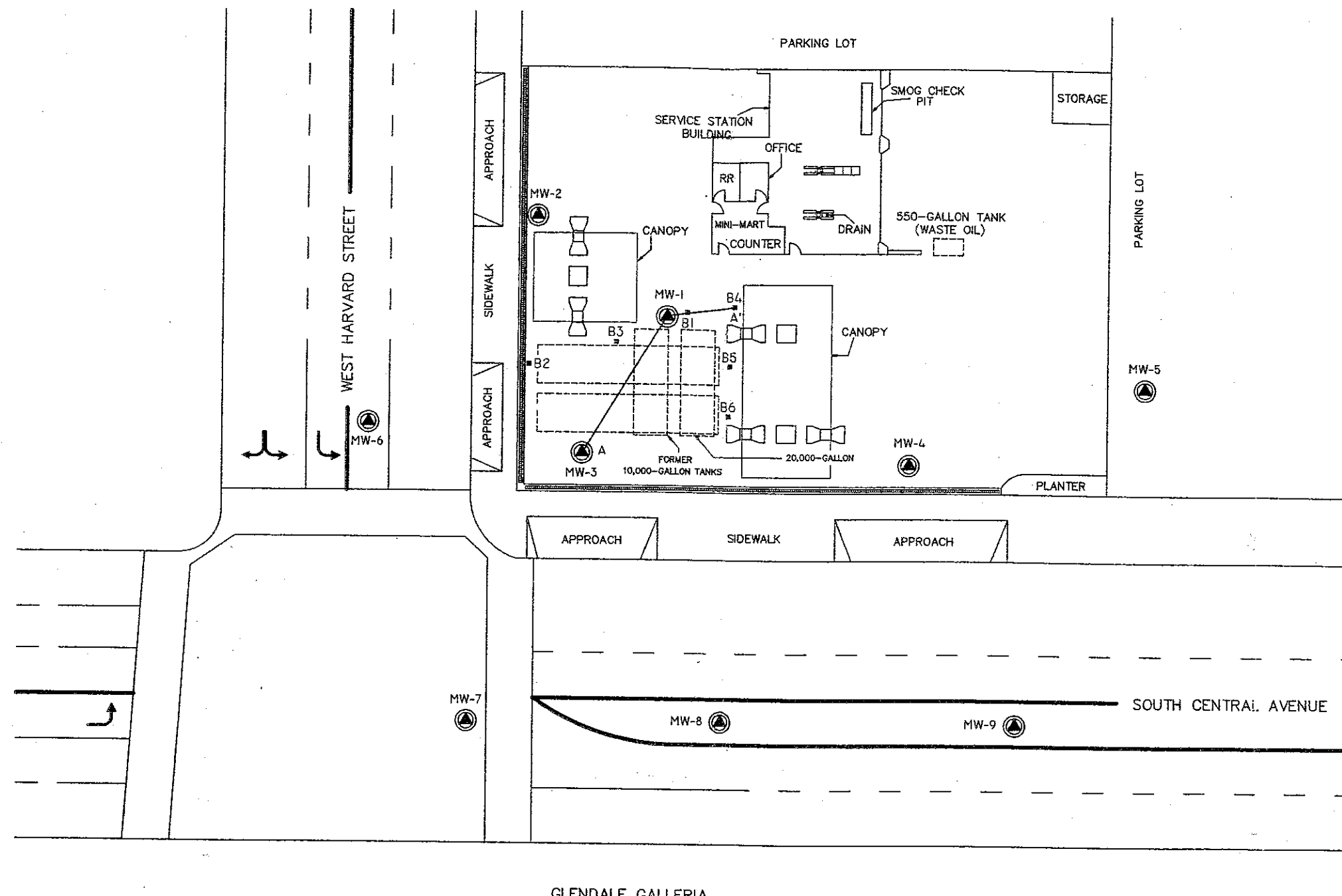
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PROJECT NO. 10902203
NAME & LOCATION: UNOCAL SS 0353
200 SOUTH CENTRAL AVENUE
GLENDALE, CALIFORNIA

LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 08/02/04

BORING NO. MW-5

PAGE: 1 OF 1
ELEVATION: 516.647' MSL
EQUIPMENT: HSA
DRILLED BY: WDC



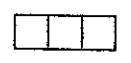
LEGEND



DISPENSER ISLANDS



HYDRAULIC HOIST



CLARIFIER



B1
LOCATION OF BORING B1 (FEBRUARY 2004)




MW-1
LOCATION OF EXISTING MONITORING WELL

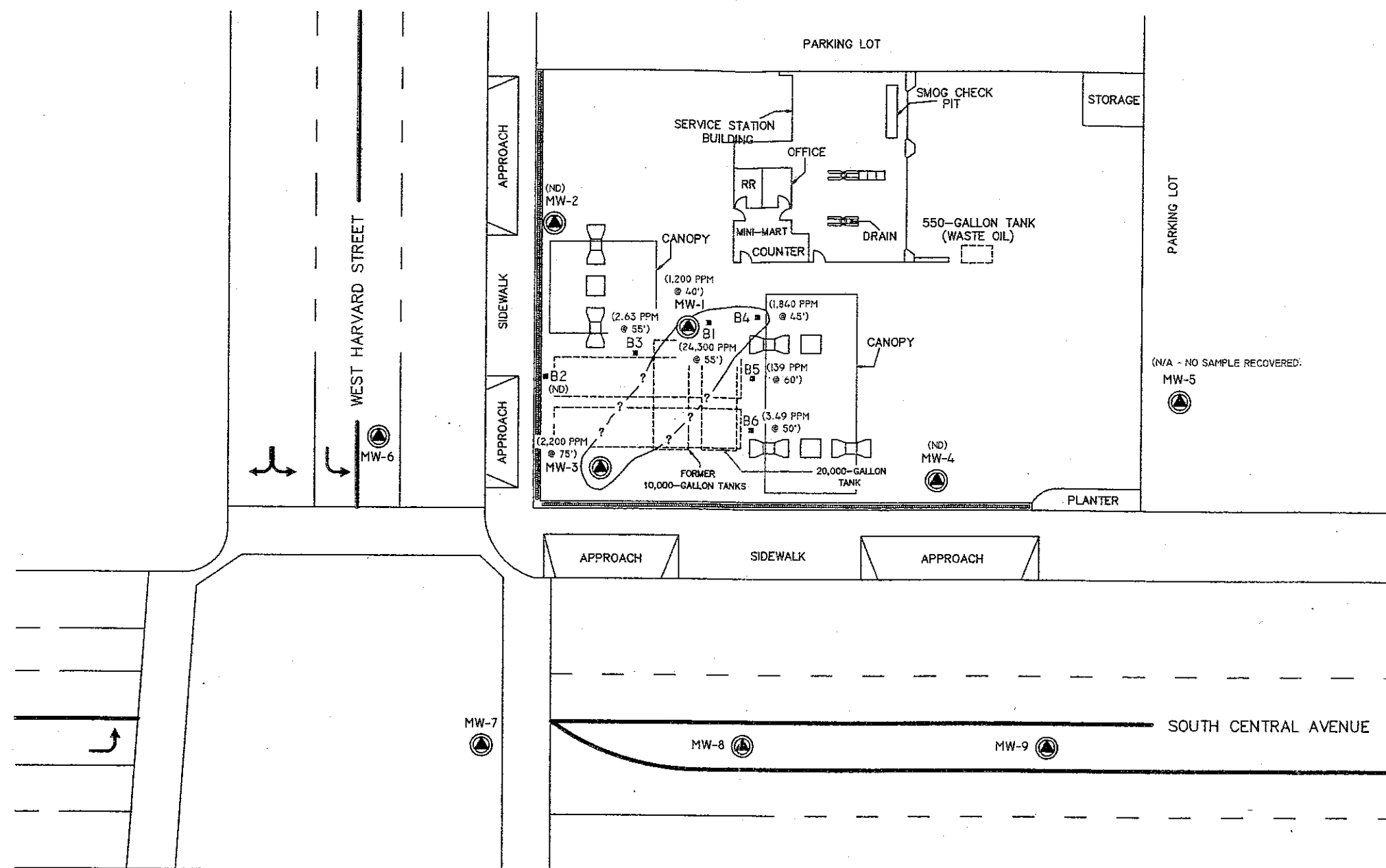
A - A'

CROSS SECTION LINE FOR FIGURE 6



SCALE 1" = 30'

TASK				ADDITIONAL GROUNDWATER ASSESSMENT			
TITLE				SITE PLAN			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 30'	DRAWN	ED	APPROVED	VH	REVISED	01/17/05
DATE	09/29/04	SHEET	1 OF 1	DRAWING NUMBER 10902204			
 EP ASSOCIATES 1111 NORTH BRAND BOULEVARD, SUITE 405 GLENDALE, CALIFORNIA 91202-3023 TEL. (818) 246-4499 FAX. (818) 246-4362				FIGURE			
				2			



LEGEND

DISPENSER ISLANDS

HYDRAULIC HOIST

CLARIFIER

APPROXIMATE LATERAL EXTENT OF TPHg (>500 mg/kg) SOIL CONTAMINATION PLUME

B1

 (24,300 PPM @ 55')

LOCATION OF BORING B1 (FEBRUARY 2004), SHOWING MAXIMUM TPHg CONCENTRATION OF 24,300 PPM AT 55 FEET BGS

MW-1

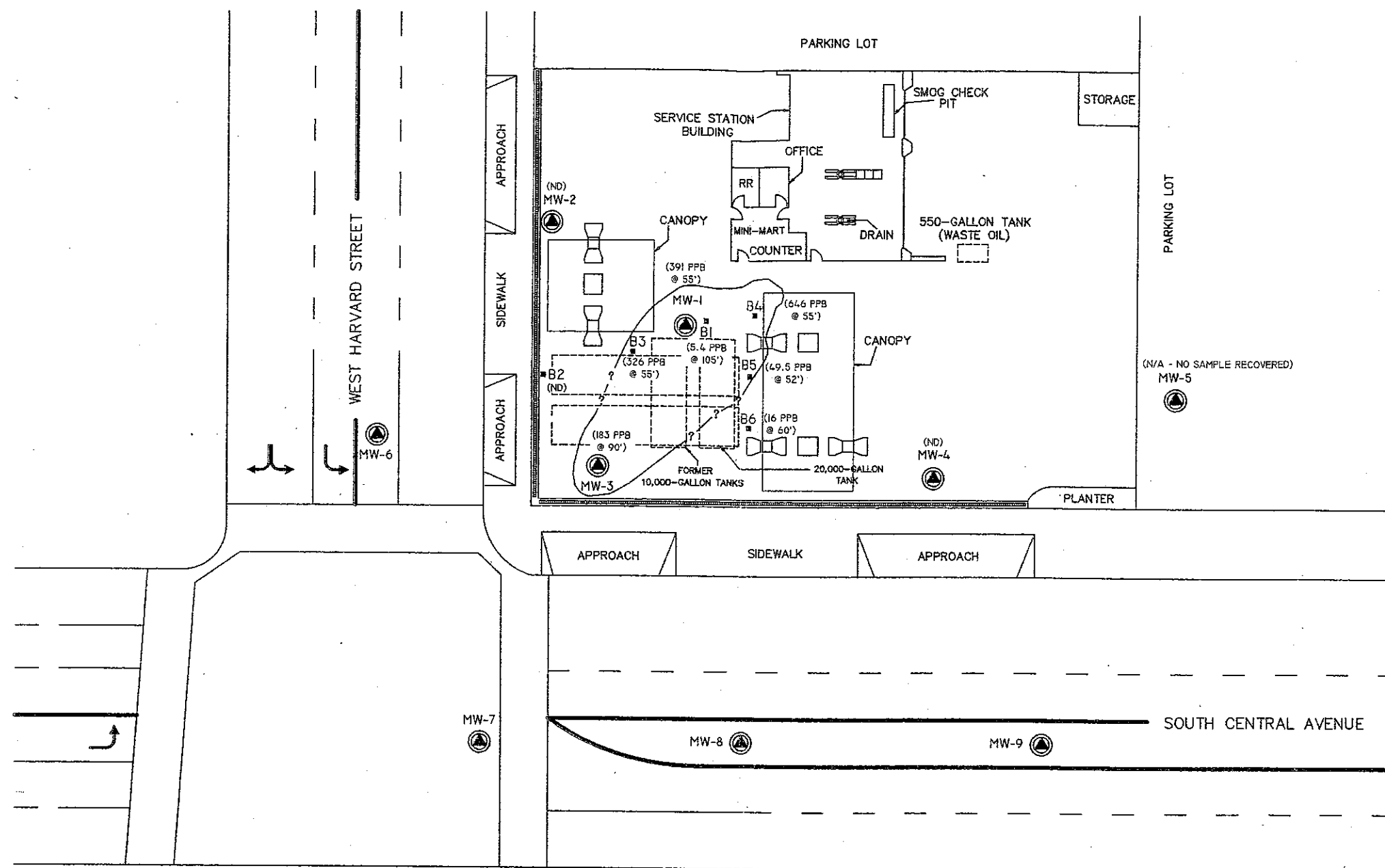
 (1,200 PPM @ 40')

LOCATION OF EXISTING MONITORING WELL MW-1 (AUGUST 2004), SHOWING MAXIMUM TPHg CONCENTRATION OF 1,200 PPM AT 40 FEET BGS

(ND) TPHg CONCENTRATION NON-DETECTED

SCALE 1" = 30'

TASK				ADDITIONAL GROUNDWATER ASSESSMENT			
TITLE				APPROXIMATE LATERAL EXTENT OF TPHg (>500 MG/KG) SOIL CONTAMINATION PLUME			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 30'	DRAWN	ED	APPROVED	VH	REVISED	01/17/05
DATE	09/29/04	SHEET	1 OF 1	DRAWING NUMBER 10902204			
				EP ASSOCIATES			
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				FIGURE 4			



LEGEND

DISPENSER ISLANDS

HYDRAULIC HOIST

CLARIFIER

APPROXIMATE LATERAL EXTENT OF MTBE SOIL CONTAMINATION PLUME

B1
(5.4 PPB @ 105')

MW-1
(391 PPB @ 55')


ND MTBE CONCENTRATION NON-DETECTED

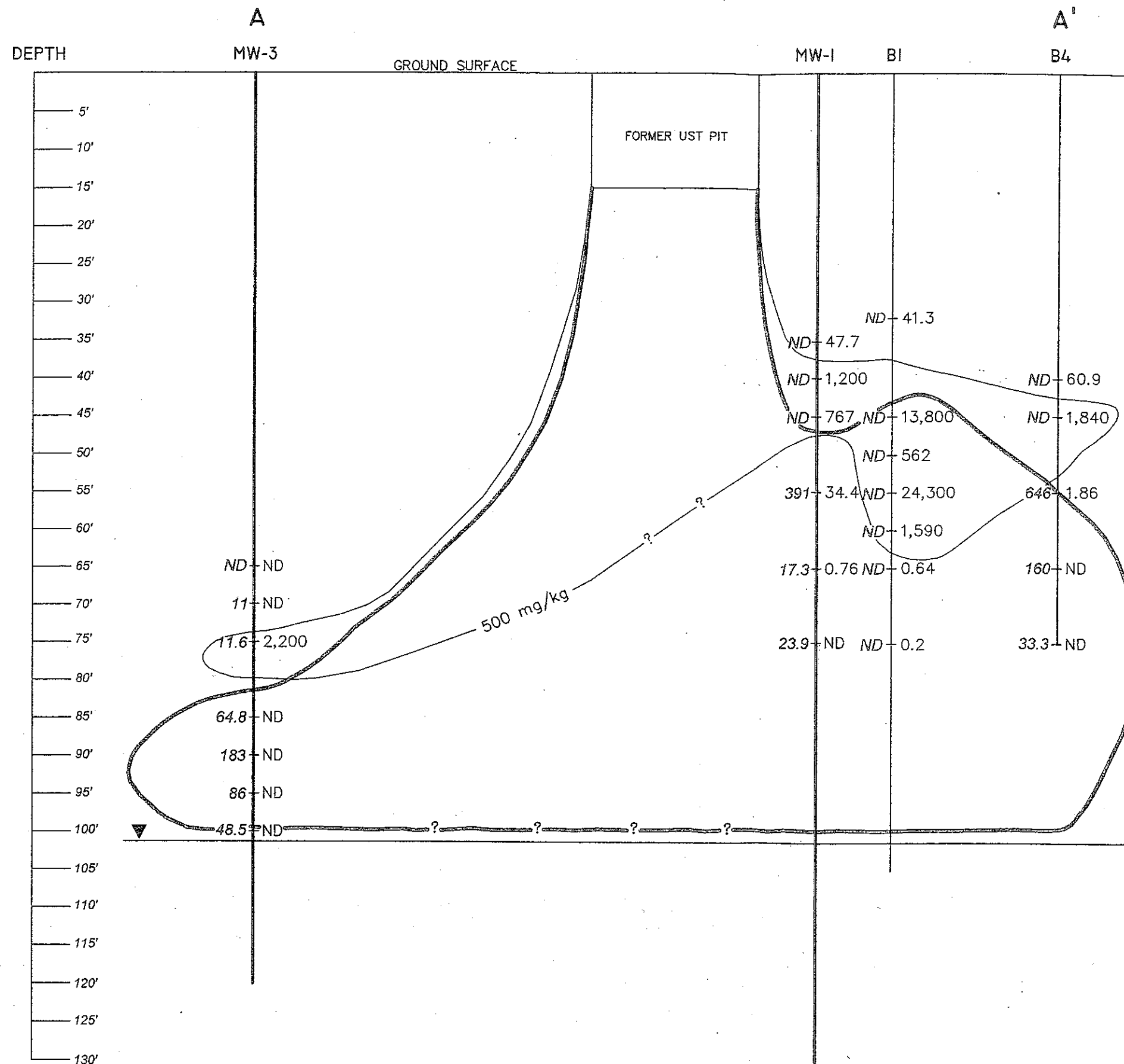
LOCATION OF BORING B1 (FEBRUARY 2004), SHOWING MAXIMUM MTBE CONCENTRATION OF 5.4 PPB AT 105 FEET BGS

LOCATION OF MONITORING WELL MW-1 (AUGUST 2004), SHOWING MAXIMUM MTBE CONCENTRATION OF 391 PPB AT 55 FEET BGS



SCALE 1" = 30'

TASK				
ADDITIONAL GROUNDWATER ASSESSMENT				
TITLE				
APPROXIMATE LATERAL EXTENT OF MTBE SOIL CONTAMINATION PLUME				
NAME				
UNOCAL SERVICE STATION 0353				
SITE ADDRESS				
200 SOUTH CENTRAL AVENUE, GLENDALE, CA				
SCALE	1" = 30'	DRAWN	ED	APPROVED
				VH
				REVISED
				01/17/05
DATE	09/29/04	SHEET	1 OF 1	DRAWING NUMBER
				10902204
				FIGURE
EP ASSOCIATES				5
1111 NORTH BRAND BOULEVARD, SUITE 405				
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LEGEND

BI LOCATION OF GEOPROBE BORING B1

ND-41.3 MTBE CONCENTRATION (NON-DETECTED)
TPHg CONCENTRATION (41.3 mg/kg)

MW-1 LOCATION OF MONITORING WELL MW-1

391-34.4 MTBE CONCENTRATION (391 ug/kg)
TPHg CONCENTRATION (34.4 mg/kg)

 GROUNDWATER TABLE


A-A' CROSS SECTION A-A'

NOTES:

MTBE IN BORING B1 WAS LIKELY DELUTED OUT OF
LABORATORY RESULTS OF THE SOIL SAMPLES.

HORIZONTAL SCALE: 1" = 10'

VERTICAL SCALE: 1" = 20'



SCALE 1" = 15'


TASK				ADDITIONAL GROUNDWATER ASSESSMENT			
TITLE				APPROXIMATE VERTICAL EXTENT OF TPHg AND MTBE SOIL CONTAMINATION - AUGUST 2004			
NAME				UNOCAL SERVICE STATION 0353			
SITE ADDRESS				200 SOUTH CENTRAL AVENUE, GLENDALE, CA			
SCALE	1" = 15'	DRAWN	ED	APPROVED	VH	REVISED	01/17/05
DATE	09/29/04	SHEET	1 OF 1	DRAWING NUMBER		10902204	
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Table 1
Summary of Analytical Results of Soil Samples
UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California

Sample No.	8015M (mg/kg) ppm				BTEX & Oxygenates, MTBE, TBA, DIPE, ETBE, TAME (8260B) (ug/kg)	VOCs by Method 8260B (ug/kg)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	Total TPH (C4-C40)		
MW-6 @ 105'	ND	ND	ND	ND	ND	ND
MW-7 @ 105'	ND	ND	ND	ND	ND	ND
MW-8 @ 105'	ND	ND	ND	ND	ND	ND
MW-9 @ 100'	ND	ND	ND	ND	ND	ND

mg/kg = milligrams per kilogram; ug/kg = micrograms per kilogram; ND = not detected (see Appendix E for laboratory Method Detection Limits)

Table 2
Results of Detected CAM Metals
UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California
(Units = mg/kg)

Constituent	Sample MW-6 @ 55'	Sample MW-7 @ 105'	Sample MW-8 @ 105'	Sample MW-9 @ 100'	TTLc mg/kg	STLC mg/l
Arsenic	2.40	ND	ND	ND	500	5
Barium	121	120	86.5	61.0	10,000	100
Chromium	15.1	13.7	8.30	10.2	2,500	560
Cobalt	11.4	10.8	7.60	5.55	8,000	80
Copper	17.6	19.0	11.5	9.95	2,500	25
Nickel	9.0	9.0	5.45	4.75	2,000	20
Vanadium	43.5	43.3	32.3	23.5	2,400	24
Zinc	62.0	56.0	38.6	29.1	5,000	250

mg/kg = milligrams per kilogram; TTLc = Total Threshold Limit Concentration; STLC = Soluble Threshold Limit Concentration; mg/l = milligrams per liter; ND = not detected (see Appendix E for laboratory Method Detection Limits)

Table 3
Summary of Groundwater Elevation Data
UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California

Well No.	Top of Well Casing Elevation (feet)	Date Measured	Depth to Groundwater (feet)	Static Water Elevation on 1-4-05 (feet above msl)
MW-1	518.789	9-10-04	102.7	416.12
		1-4-05	103.02	415.77
MW-2	518.179	9-10-04	102.3	415.93
		1-4-05	102.59	415.59
MW-3	517.756	9-10-04	101.86	415.96
		1-4-05	102.15	415.61
MW-4	517.310	9-10-04	102.20	416.15
		1-4-05	101.51	415.80
MW-5	516.847	9-10-04	100.63	416.08
		1-4-05	100.93	415.72
MW-6	517.324	1-4-05	102.17	415.15
MW-7	516.784	1-4-05	101.92	414.86
MW-8	516.144	1-4-05	100.32	415.82
MW-9	515.502	1-4-05	100.82	414.68

Table 4
Summary of Analytical Results of Groundwater Samples Collected on January 4, 2005
UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California
















Sample No.	8015M (mg/l)				VOCs by Method 8260B (ug/l)
	C4-C12 Gasoline	C13-C22 Diesel	C23-C40 Oil	C13-C40 Total	
MW-1	ND	ND	ND	ND	Carbon Disulfide - 0.5 Carbon Tetrachloride - 1.6 Chloroform - 1.0 Tetrachloroethene (PCE) - 0.5 Trichloroethene (TCE) - 1.5 Trichlorofluoromethane - 6.2
MW-2	ND	ND	ND	ND	Carbon Tetrachloride - 0.8 Chloroform - 0.9 TCE - 0.6
MW-3	ND	ND	ND	ND	Carbon Tetrachloride - 0.5 Chloroform - 0.7 PCE - 0.8 MTBE - 18.7
MW-4	ND	ND	ND	ND	Carbon Tetrachloride - 1.2 Chloroform - 1.1 TCE - 1.3 Trichlorofluoromethane - 5.5
MW-5	ND	0.503	ND	0.535	Carbon Tetrachloride - 0.8 Chloroform - 1.0 1,2-Dichloroethane - 1.1 TCE - 1.5 Trichlorofluoromethane - 5.3
MW-6	ND	ND	ND	ND	Chloroform - 1.0 PCE - 0.6 MTBE - 8.0
MW-7	ND	ND	ND	ND	Chloroform - 0.9 MTBE - 2.0
MW-8	ND	ND	ND	ND	Carbon Tetrachloride - 0.6 Chloroform - 0.8 PCE - 0.7 MTBE - 1.2
MW-9	ND	ND	ND	ND	Chloroform - 1.0 PCE - 0.9
Trip Blank	--	--	--	--	ND

mg/l = milligrams per liter; ug/l = micrograms per liter; ND = not detected (see Appendix F for laboratory Method Detection Limits); -- = not analyzed

Table 5
Summary of Historical Analytical Results of Groundwater Samples for
Main Chemical Constituents
UNOCAL Service Station 0353
200 South Central Avenue, Glendale, California

Well No.	Sample Date	TPHg (mg/l)	TPHd (mg/l)	Benzene (ug/l)	MTBE (ug/l)	PCE (ug/l)	TCE (ug/l)	Carbon Tetrachloride (ug/l)
MW-1	9-10-04	0.019	ND	ND	27.7	ND	2.5	0.9
	1-4-05	ND	ND	ND	ND	0.5	1.5	1.6
MW-2	9-10-04	0.013	ND	ND	14.9	ND	ND	ND
	1-4-05	ND	ND	ND	ND	ND	0.6	0.8
MW-3	9-10-04	0.185	ND	2.6	217	0.5	ND	ND
	1-4-05	ND	ND	ND	18.7	0.8	ND	0.5
MW-4	9-10-04	0.033	ND	ND	44.5	ND	0.8	ND
	1-4-05	ND	ND	ND	ND	ND	1.3	1.2
MW-5	9-10-04	ND	ND	ND	ND	ND	1.1	ND
	1-4-05	ND	0.535	ND	ND	ND	1.5	0.8
MW-6	1-4-05	ND	ND	ND	8.0	0.6	ND	ND
MW-7	1-4-05	ND	ND	ND	2.0	ND	ND	ND
MW-8	1-4-05	ND	ND	ND	1.2	0.7	ND	0.6
MW-9	1-4-05	ND	ND	ND	ND	0.9	ND	ND
MCL		N/A	N/A	1	13	5	5	0.5

mg/l = milligrams per liter; ug/l = micrograms per liter; ND = not detected (see Appendix E for laboratory Method Detection Limits); MCL = Maximum Contaminant Levels; N/A = not applicable

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVEL WITH OVER 12% FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL-GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE-GRAINED SOIL MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, L. CLAYS
			OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

- - "UNDISTURBED" SPLIT-SPOON OR SHELBY TUBE SAMPLE
- ▣ - BULK OR CLASSIFICATION SAMPLE
- ▤ - STANDARD PENETRATION TEST SAMPLE
- ▥ - NO SAMPLE RECOVERED
- I - CORE SAMPLE
- ▽ - DEPTH TO FIRST GROUND WATER ENCOUNTERED
- ▼ - DEPTH TO STABILIZED GROUND WATER

HC ODOR - HYDROCARBON ODOR

- NO - NO ODOR
- LO - SLIGHT ODOR
- MD - MODERATE ODOR
- SG - STRONG ODOR

VOC (PPM) - VOLATILE ORGANIC COMPOUND VAPOR CONCENTRATIONS IN PARTS PER MILLION DETECTED BY PHOTOIONIZATION DETECTOR OR ORGANIC VAPOR ANALYZER

BLOWS/6" - BLOWS REQUIRED TO DRIVE SAMPLER 6 INCHES WITH A 140-POUND HAMMER FALLING 30 INCHES



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200 SOUTH CENTRAL AVENUE
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KEY TO BORING LOG

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
9.7	N							3" - 4" asphalt
0.1	N			10				SAND, brown, fine to coarse with some fine to coarse gravel
9.2	N			20				augers grinding GRAVELLY SAND, fine to coarse sand and gravel; cobbles to 3"; poorly sorted, loose, damp
1.7	N			30				- same
1.3	N			40				~ 30% fine to coarse gravel
4.1	N			50				- same
0.1	N			60				SAND, brown, mostly fine with some coarse sand and fine gravel
7.0	N			70				- mostly fine to medium sand with some fine to coarse gravel
5.7	N			80				SAND, brown, mostly fine with some fine gravel, moderate sorting
4.0	N			90				SILTY SAND, brown, fine sand
10.1	N			100				SAND, fine to coarse sand and gravel with fines, very poorly sorted
1.1	N	60 19 25					SM	SILTY SAND, brown, fine sand and gravel, medium dense, moist
14.6	N			110				CLAYEY, SILTY SAND, with fine gravel, saturated
				120				End of boring at 123' bgs; encountered groundwater at approximately 102.5' bgs; set 4" pvc groundwater monitoring well at 120' bgs.
				130				
				140				
				150				



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LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 12/16/04

BORING NO. MW-6

PAGE:
ELEVATION:
EQUIPMENT: CME 85
DRILLED BY: WEST HAZMAT

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
22.4	N							4"-6" asphalt
40.2	N			10				SAND, brown, fine-grained, with some coarse gravel and cobbles to 3", poorly sorted, loose, damp
26.8	N			20				SAND, fine to coarse sand and gravel
				30				GRAVELLY SAND, fine to coarse sand and gravel with cobbles
29.6	N			40				
31.7	N			50				- same, but no cobbles
20.5	N			60				SILTY SAND, fine to coarse sand and some fine gravel
				70				
32.6	N			80				- same, but with some coarse gravel
36.9	N			90				SAND, mostly fine, with some fine gravel
34.7	N			100				SAND, light brown, mostly fine to medium, moderate sorting
20.1	N	13 19 21		110			SM	SILTY SAND, brown, fine to coarse sand and some fine gravel, some clay, poorly sorted, medium dense, moist to wet
48.2	N			120				SAND, fine to coarse, saturated
1.2	N			130				End of boring at 123' bgs; encountered groundwater at approximately 105' bgs; set 4" pvc groundwater monitoring well at 120' bgs.
				140				
				150				



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LOGGED BY: ROBIN KIM
 QC BY: VH
 DATE: 12/15/04

BORING NO. MW-7

PAGE:
 ELEVATION:
 EQUIPMENT: CME 85
 DRILLED BY: WEST HAZMAT

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
28.6	N							6" asphalt
43.1	N			10				SAND, tan, fine to coarse, loose, damp - some fine to coarse gravel
39.5	N			20				- some fine gravel
37.7	N			30				- same
36.8	N			40				- same
29.6	N			50				SILTY SAND, brown, fine to coarse sand with fine gravel
31.6	N			60				SAND, fine to coarse with fine gravel
23.5	N			70				SILTY SAND, fine to coarse sand, no gravel, damp
24.6	N			80				SILTY SAND, mostly fine sand
22.2	N			90				- same
23.8	N			100				SILTY SAND, fine to coarse sand and some fine gravel
23.6	N						SM/SC	SILTY SAND/CLAYEY SAND, brown, mostly fine to medium sand, dense, moist
26.7	N			110				- same but saturated
29.4	N			120				- same
				130				End of boring at 123' bgs; encountered groundwater at approximately 105' bgs; set 4" pvc groundwater monitoring well at 119' bgs.
				140				
				150				



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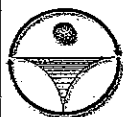
LOGGED BY: ROBIN KIM
QC BY: VH
DATE: 12/14/04

BORING NO. MW-8

PAGE:
ELEVATION:
EQUIPMENT: CME 85
DRILLED BY: WEST HAZMAT

LOG OF BORING

VOC (PID)	HC ODOR	BLOWS/6"	GROUND WATER LEVELS	DEPTH FT	SAMPLE	WELL CONSTRUCTION DETAIL	U S C S	DESCRIPTION
				10				4"-6" asphalt
16.8	N			20				SAND, brown, fine to coarse with fine gravel, poorly sorted, dense, damp
20.8	N			30				GRAVELLY SAND, fine to coarse sand and gravel
24.6	N			40				SAND, fine to coarse sand and some fine gravel
				50				- same
23.4	N			60				
				70				
				80				
38.7	N			90				SAND, mostly fine to medium sand, some coarse sand and fine gravel
38.9	N	16 25 27	▼	100			SM	SILTY SAND, brown, fine to coarse sand and some fine gravel, some clay, medium dense, moist
32.9	N			110				- same, but saturated
37.1	N			120				- same
				130				End of boring at 123' bgs; encountered groundwater at approximately 105' bgs; set 4" pvc groundwater monitoring well at 120' bgs.
				140				
				150				

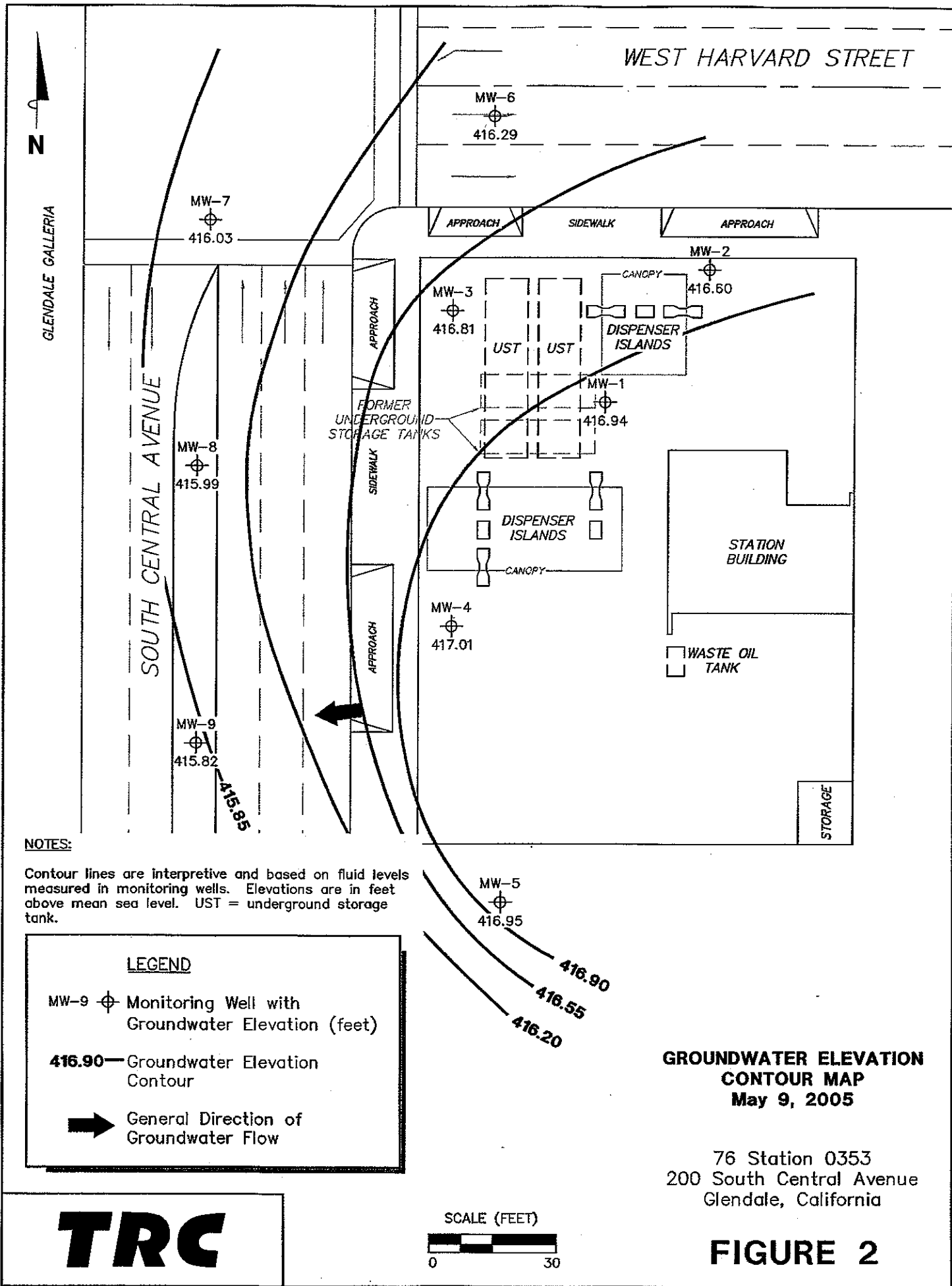


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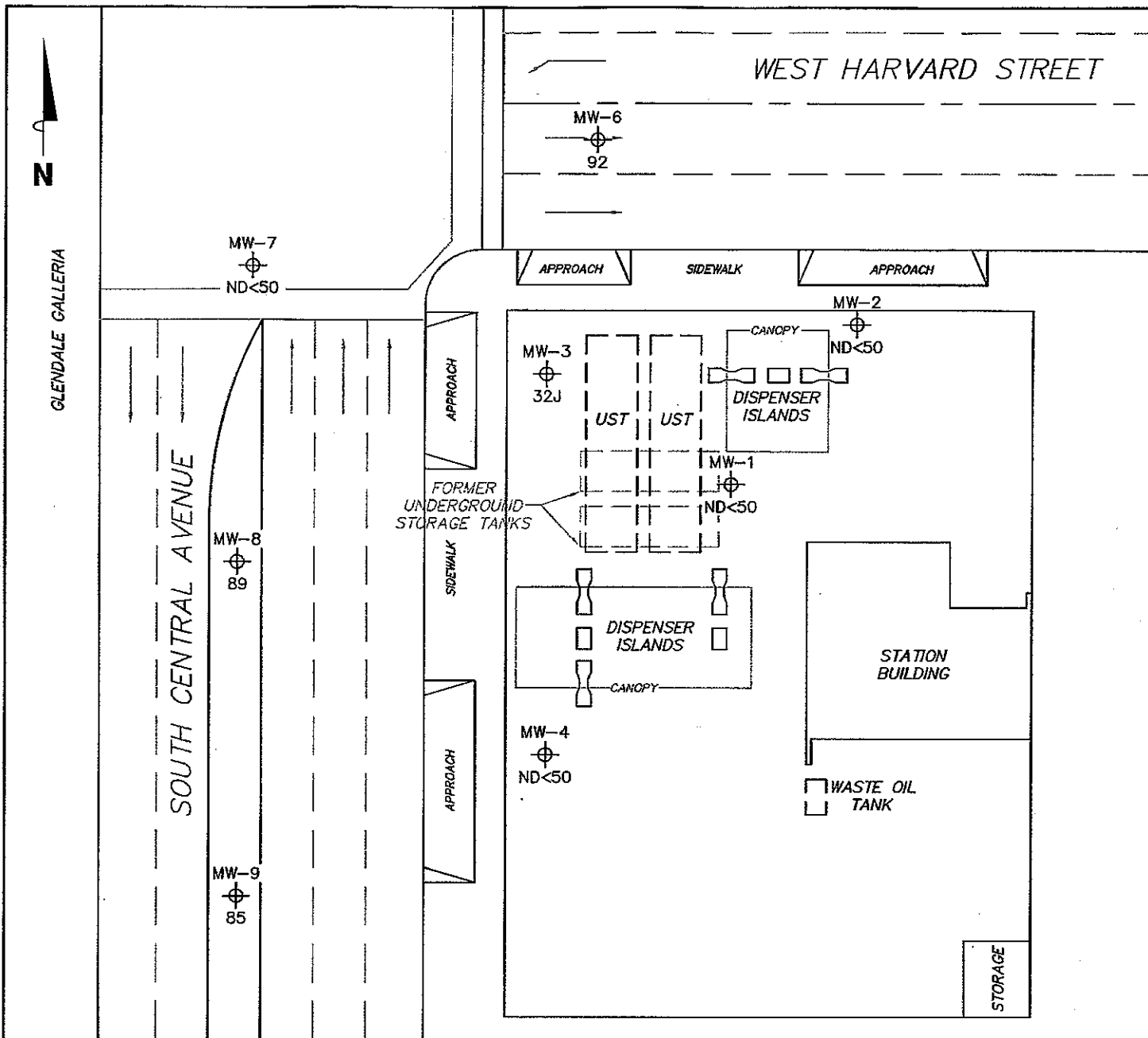
PROJECT NO. 10902204
 NAME & LOCATION: UNOCAL SS 0353
 200 SOUTH CENTRAL AVENUE
 GLENDALE, CALIFORNIA
 LOGGED BY: ROBIN KIM
 QC BY: VH
 DATE: 12/13/04

BORING NO. MW-9

PAGE:
 ELEVATION:
 EQUIPMENT: CME 85
 DRILLED BY: WEST HAZMAT




PS=1:1 0353-003



NOTES:

TPPH = total purgeable petroleum hydrocarbons.
 $\mu\text{g/l}$ = micrograms per liter. ND = not detected
 at limit indicated on official laboratory report.
 J = estimated concentration, value is between the
 Method Detection Limit (MDL) and the Practical
 Quantitation Limit (PQL). UST = underground
 storage tank. Results obtained using EPA Method
 8260B.

LEGEND

MW-9  Monitoring Well with
 Dissolved-Phase TPPH
 Concentration ($\mu\text{g/l}$)

DISSOLVED-PHASE TPPH CONCENTRATION MAP May 9, 2005

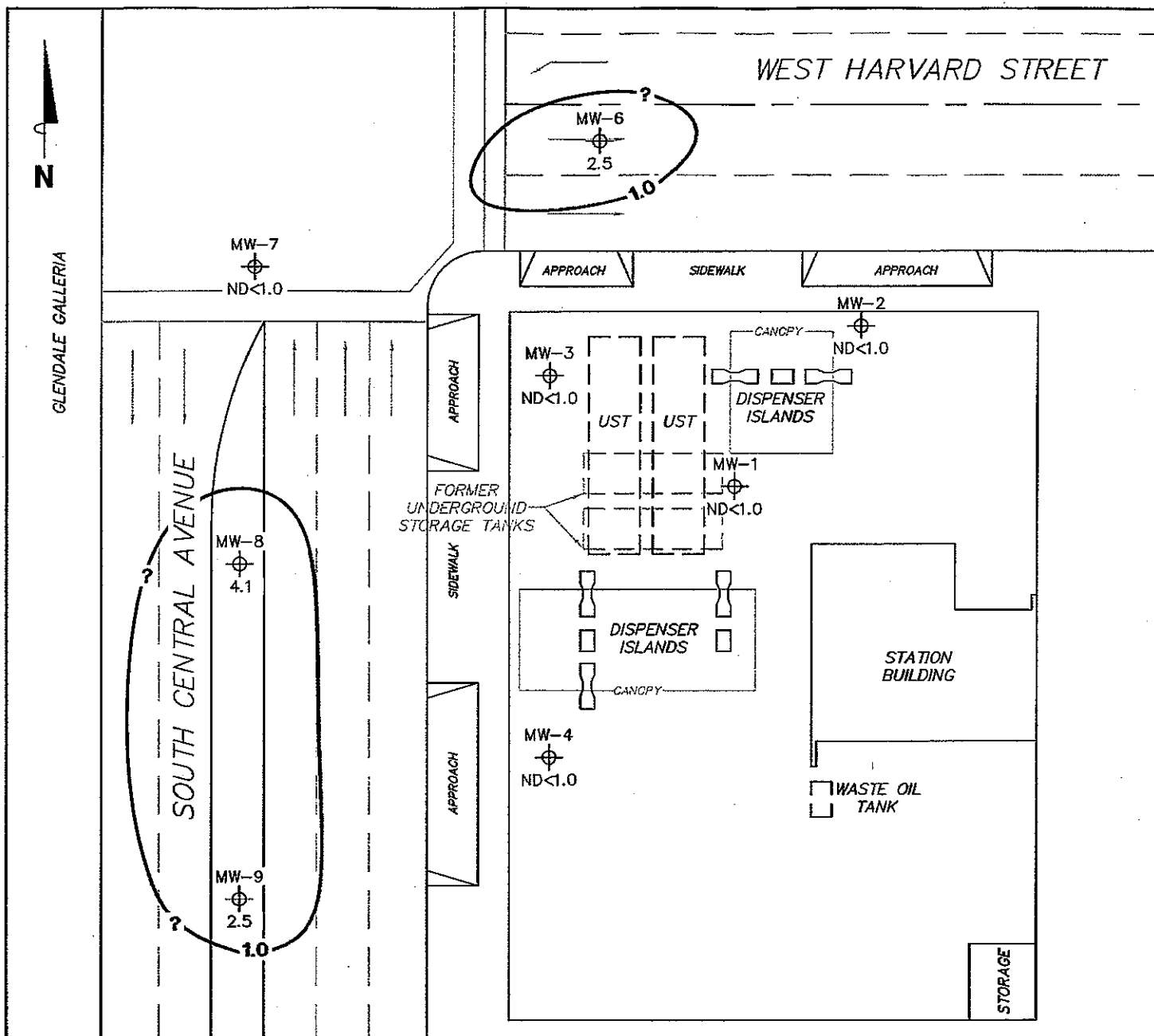
76 Station 0353
 200 South Central Avenue
 Glendale, California

TRC

SCALE (FEET)



FIGURE 3



NOTES:

Contour lines are interpretive and based on laboratory analysis results of groundwater samples. $\mu\text{g/l}$ = micrograms per liter. ND = not detected at limit indicated on official laboratory report. UST = underground storage tank.

LEGEND

MW-9 Monitoring Well with Dissolved-Phase Benzene Concentration ($\mu\text{g/l}$)

1.0 Dissolved-Phase Benzene Contour ($\mu\text{g/l}$)

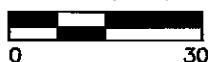
DISSOLVED-PHASE BENZENE CONCENTRATION MAP May 9, 2005

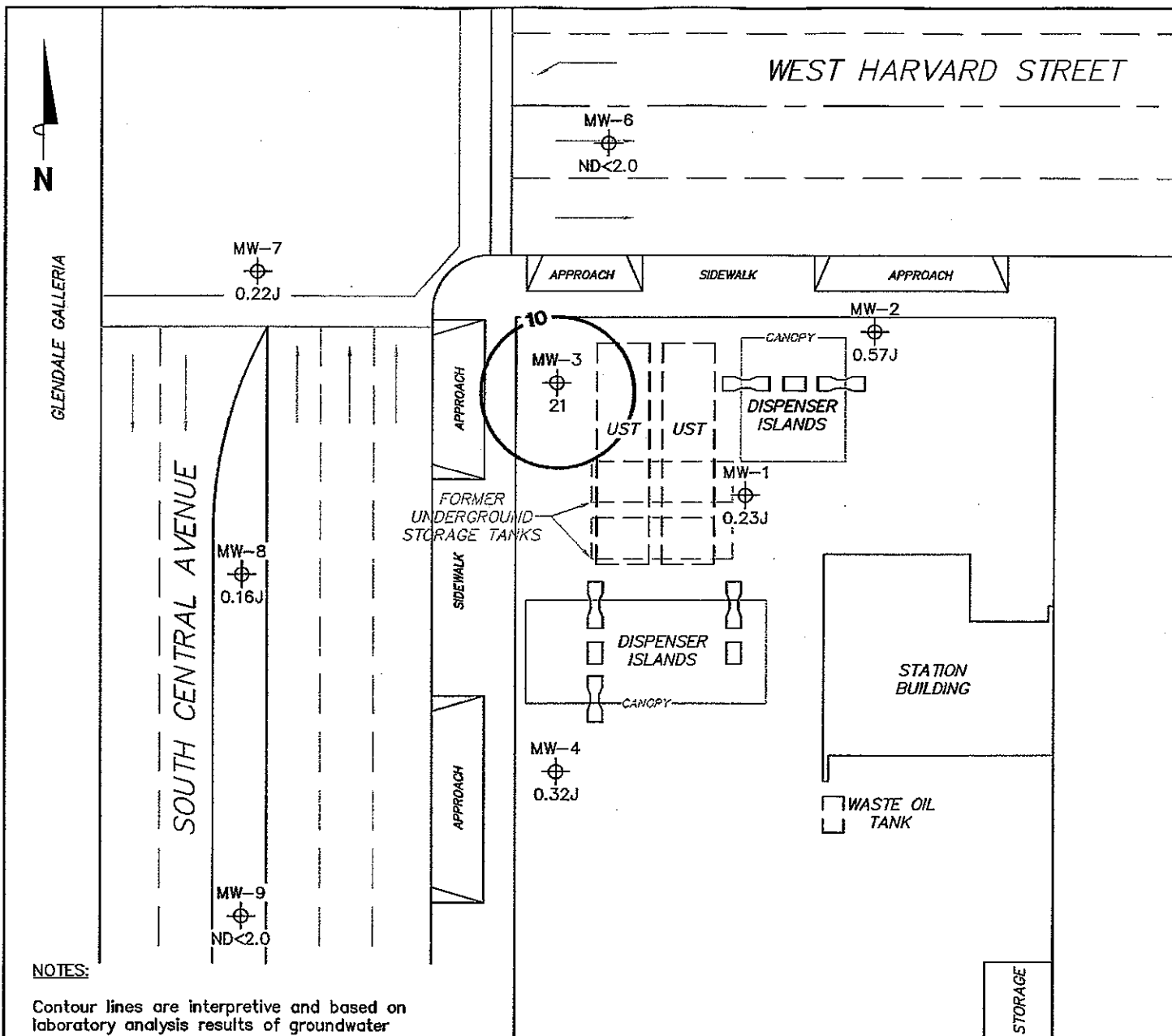
76 Station 0353
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Glendale, California

FIGURE 4

TRC

SCALE (FEET)





NOTES:

Contour lines are interpretive and based on laboratory analysis results of groundwater samples. MTBE = methyl tertiary butyl ether. $\mu\text{g/l}$ = micrograms per liter. ND = not detected at limit indicated on official laboratory report. J = estimated concentration, value is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL). UST = underground storage tank. Results obtained using EPA Method 8260B.

LEGEND

- MW-9 Monitoring Well with Dissolved-Phase MTBE Concentration ($\mu\text{g/l}$)
- 10 Dissolved-Phase MTBE Contour ($\mu\text{g/l}$)

**DISSOLVED-PHASE MTBE
CONCENTRATION MAP
May 9, 2005**

76 Station 0353
200 South Central Avenue
Glendale, California

TRC

SCALE (FEET)



FIGURE 5

TABLE KEY

STANDARD ABBREVIATIONS

--	=	not analyzed, measured, or collected
LPH	=	liquid-phase hydrocarbons
Trace	=	less than 0.01 foot of LPH in well
µg/l	=	micrograms per liter (approx. equivalent to parts per billion, ppb)
mg/l	=	milligrams per liter (approx. equivalent to parts per million, ppm)
ND<	=	not detected at or above laboratory detection limit
TOC	=	top of casing (surveyed reference elevation)

ANALYTES

BTEX	=	benzene, toluene, ethylbenzene, and (total) xylenes
DIPE	=	di-isopropyl ether
ETBE	=	ethyl tertiary butyl ether
MTBE	=	methyl tertiary butyl ether
PCB	=	polychlorinated biphenyls
PCE	=	tetrachloroethene
TBA	=	tertiary butyl alcohol
TCA	=	trichloroethane
TCE	=	trichloroethene
TPH-G	=	total petroleum hydrocarbons with gasoline distinction
TPH-D	=	total petroleum hydrocarbons with diesel distinction
TPPH	=	total purgeable petroleum hydrocarbons
TRPH	=	total recoverable petroleum hydrocarbons
TAME	=	tertiary amyl methyl ether
1,1-DCA	=	1,1-dichloroethane
1,2-DCA	=	1,2-dichloroethane (same as EDC, ethylene dichloride)
1,1-DCE	=	1,1-dichloroethene
1,2-DCE	=	1,2-dichloroethene (cis- and trans-)

NOTES

- Elevations are in feet above mean sea level. Depths are in feet below surveyed top-of-casing.
- Groundwater elevations for wells with LPH are calculated as: $\text{Surface Elevation} - \text{Measured Depth to Water} + (\text{Dp} \times \text{LPH Thickness})$, where Dp is the density of the LPH, if known. A value of 0.75 is used for gasoline and when the density is not known. A value of 0.83 is used for diesel.
- Wells with LPH are generally not sampled for laboratory analysis (see General Field Procedures).
- Comments shown on tables are general. Additional explanations may be included in field notes and laboratory reports, both of which are included as part of this report.
- A "J" flag indicates that a reported analytical result is an estimated concentration value between the method detection limit (MDL) and the practical quantification limit (PQL) specified by the laboratory.
- Other laboratory flags (qualifiers) may have been reported. See the official laboratory report (attached) for a complete list of laboratory flags.
- Concentration graphs based on tables (presented following Figures) show non-detect results prior to the Second Quarter 2000 plotted at fixed values for graphical display. Non-detect results reported since that time are plotted at reporting limits stated in the official laboratory report.
- Groundwater vs. Time graphs may be corrected for apparent level changes due to resurvey.

Table 1

SUMMARY OF GROUNDWATER LEVELS AND CHEMICAL ANALYSIS RESULTS

May 9, 2005

Former 76 Station 0353

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground- water Elevation (feet)	Change in Elevation (feet)	TPH-G (µg/l)	TPPH 8260B (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl- benzene (µg/l)	Total Xylenes (µg/l)	MTBE 8021B (µg/l)	MTBE 8260B (µg/l)	TBA 8260B (µg/l)	Comments
MW-1															
05/09/05	518.79	101.85	0.00	416.94	1.17	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.23J	ND<50	
MW-2															
05/09/05	518.18	101.58	0.00	416.60	1.01	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.57J	ND<50	
MW-3															
05/09/05	517.76	100.95	0.00	416.81	1.20	--	32J	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	21	ND<50	
MW-4															
05/09/05	517.31	100.30	0.00	417.01	1.21	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.32J	ND<50	
MW-5															
05/09/05	516.85	99.90	0.00	416.95	1.03	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.16J	ND<50	
MW-6															
05/09/05	517.32	101.03	0.00	416.29	1.14	--	92	2.5	3.6	3.5	11	--	ND<2.0	ND<50	
MW-7															
05/09/05	516.78	100.75	0.00	416.03	1.17	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.22J	ND<50	
MW-8															
05/09/05	516.14	100.15	0.00	415.99	0.17	--	89	4.1	3.3	0.65J	14	--	0.16J	ND<50	
MW-9															
05/09/05	515.50	99.68	0.00	415.82	1.14	--	85	2.5	3.6	3.3	10	--	ND<2.0	ND<50	

Table 2

HISTORIC GROUNDWATER LEVELS AND CHEMICAL ANALYSIS RESULTS

September 2004 Through May 2005

Former 76 Station 0353

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-water Elevation (feet)	Change in Elevation (feet)	TPH-G (µg/l)	TPPH 8260B (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE 8021B (µg/l)	MTBE 8260B (µg/l)	TBA 8260B (µg/l)	Comments
MW-1 (Screen Interval in feet: 90-128)															
09/10/04	518.79	102.70	0.00	416.09	--	--	--	--	--	--	--	--	--	--	--
01/04/05	518.79	103.02	0.00	415.77	-0.32	--	--	--	--	--	--	--	--	--	--
05/09/05	518.79	101.85	0.00	416.94	1.17	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.23J	ND<50	--
MW-2 (Screen Interval in feet: 90-119)															
09/10/04	518.18	102.30	0.00	415.88	--	--	--	--	--	--	--	--	--	--	--
01/04/05	518.18	102.59	0.00	415.59	-0.29	--	--	--	--	--	--	--	--	--	--
05/09/05	518.18	101.58	0.00	416.60	1.01	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.57J	ND<50	--
MW-3 (Screen Interval in feet: 90-119)															
09/10/04	517.76	101.86	0.00	415.90	--	--	--	--	--	--	--	--	--	--	--
01/04/05	517.76	102.15	0.00	415.61	-0.29	--	--	--	--	--	--	--	--	--	--
05/09/05	517.76	100.95	0.00	416.81	1.20	--	32J	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	21	ND<50	--
MW-4 (Screen Interval in feet: 80-119)															
09/10/04	517.31	102.20	0.00	415.11	--	--	--	--	--	--	--	--	--	--	--
01/04/05	517.31	101.51	0.00	415.80	0.69	--	--	--	--	--	--	--	--	--	--
05/09/05	517.31	100.30	0.00	417.01	1.21	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.32J	ND<50	--
MW-5 (Screen Interval in feet: 90-119)															
09/10/04	516.85	100.63	0.00	416.22	--	--	--	--	--	--	--	--	--	--	--
01/04/05	516.85	100.93	0.00	415.92	-0.30	--	--	--	--	--	--	--	--	--	--
05/09/05	516.85	99.90	0.00	416.95	1.03	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.16J	ND<50	--
MW-6 (Screen Interval in feet: DNA)															
09/10/04	517.32	102.17	0.00	415.15	--	--	--	--	--	--	--	--	--	--	--
01/04/05	517.32	102.17	0.00	415.15	0.00	--	--	--	--	--	--	--	--	--	--
05/09/05	517.32	101.03	0.00	416.29	1.14	--	92	2.5	3.6	3.5	11	--	ND<2.0	ND<50	--
MW-7 (Screen Interval in feet: 90-120)															

Table 2

HISTORIC GROUNDWATER LEVELS AND CHEMICAL ANALYSIS RESULTS

September 2004 Through May 2005

Former 76 Station 0353

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground- water Elevation (feet)	Change in Elevation (feet)	TPH-G (µg/l)	TPPH 8260B (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl- benzene (µg/l)	Total Xylenes (µg/l)	MTBE 8021B (µg/l)	MTBE 8260B (µg/l)	TBA 8260B (µg/l)	Comments
MW-7 continued															
09/10/04	516.78	101.92	0.00	414.86	--	--	--	--	--	--	--	--	--	--	--
01/04/05	516.78	101.92	0.00	414.86	0.00	--	--	--	--	--	--	--	--	--	--
05/09/05	516.78	100.75	0.00	416.03	1.17	--	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	0.22J	ND<50	ND<50
MW-8 (Screen Interval in feet: 90-119)															
09/10/04	516.14	100.32	0.00	415.82	--	--	--	--	--	--	--	--	--	--	--
01/04/05	516.14	100.32	0.00	415.82	0.00	--	--	--	--	--	--	--	--	--	--
05/09/05	516.14	100.15	0.00	415.99	0.17	--	89	4.1	3.3	0.65J	14	--	0.16J	ND<50	ND<50
MW-9 (Screen Interval in feet: DNA)															
09/10/04	515.50	100.82	0.00	414.68	--	--	--	--	--	--	--	--	--	--	--
01/04/05	515.50	100.82	0.00	414.68	0.00	--	--	--	--	--	--	--	--	--	--
05/09/05	515.50	99.68	0.00	415.82	1.14	--	85	2.5	3.6	3.3	10	--	ND<2.0	ND<50	ND<50

Table 3
 ADDITIONAL ANALYTICAL RESULTS
 Former 76 Station 0353

Date Sampled	NO3 (mg/l)	Sulfate (mg/l)	Alka-linity (mg/l)	TAME 8260B (µg/l)	DIPE 8260B (µg/l)	ETBE 8260B (µg/l)	Fe+2 (µg/l)	Mang (µg/l)	Ethanol 8260B (µg/l)
MW-1 05/09/05	--	--	--	ND<2.0	ND<2.0	ND<2.0	--	--	ND<1000
MW-2 05/09/05	--	--	--	ND<2.0	ND<2.0	ND<2.0	--	--	ND<1000
MW-3 05/09/05	8.2	150	270	ND<2.0	ND<2.0	ND<2.0	190	2.6J	ND<1000
MW-4 05/09/05	21	130	340	ND<2.0	ND<2.0	ND<2.0	310	2.2J	ND<1000
MW-5 05/09/05	--	--	--	ND<2.0	ND<2.0	ND<2.0	--	--	ND<1000
MW-6 05/09/05	--	--	--	ND<2.0	ND<2.0	ND<2.0	--	--	ND<1000
MW-7 05/09/05	10	170	390	ND<2.0	ND<2.0	ND<2.0	690	30	ND<1000
MW-8 05/09/05	--	--	--	ND<2.0	ND<2.0	ND<2.0	--	--	ND<1000
MW-9 05/09/05	--	--	--	ND<2.0	ND<2.0	ND<2.0	--	--	ND<1000

APPENDIX B

OVERVIEW OF FEASIBLE REMEDIAL ALTERNATIVES

APPENDIX B

OVERVIEW OF FEASIBLE REMEDIAL ALTERNATIVES

Advantages and disadvantages, limitations, and regulatory and economic concerns for several feasible remediation alternatives (passive remediation/risk assessment, excavation and disposal/treatment, and vapor extraction) are discussed in Appendix B.

PASSIVE REMEDIATION/RISK ASSESSMENT

Natural attenuation/biodegradation is a viable alternative to active remediation when soil and groundwater contaminants do not pose a significant threat to sensitive receptors (e.g., drinking water wells, groundwater recharge areas). Risk assessment involving environmental fate modeling can be used to evaluate the threat to these receptors. When human exposure to hydrocarbon vapors is a possibility, a comprehensive health-based risk assessment can be used to determine whether present site conditions require corrective action to protect public health. The evaluation of the risk assessment consists of estimating the potential risks associated with present site conditions. These estimated risks can be compared to allowable risk levels, if established. If the estimated risks exceed allowable risk levels, then the risk assessment can be used to derive site-specific cleanup levels.

The applicability of the risk assessment is based on site-specific conditions and characteristics of the chemicals present in the subsurface. Applicability is evaluated by completing a comprehensive human health-based risk assessment and/or environmental fate analysis.

Advantages: Risk assessments are scientifically defensible and based on the most current understanding of the chemical toxicity and potential human exposures. In addition, a risk assessment provides a logical transition from the acquisition of site-specific data to the evaluation of the data in the context of potential exposures. Risk assessment is based on the methodologies of the U.S. Environmental Protection Agency (USEPA), California Environmental Protection Agency (CEPA) and American Society of Testing and Materials (ASTM). A comprehensive risk assessment may also be useful in addressing potential future liabilities associated with a change in zoning or site use.

Remedial Action Plan

Former 76 Station 0353

July 11, 2005

Disadvantages: The decision to accept site closure through risk assessment is based on the discretion of the lead regulatory agency and may be influenced by regulatory agency experience with risk assessment or political factors associated with the site.

Discussion: Based on this evaluation of feasible corrective action and review of remediation alternatives, passive remediation is not considered to be the most viable option for hydrocarbon-affected present at this site due to the pending site re-development. However, remediation of the adsorbed-phase hydrocarbons in the apparent source area, and passive remediation of dissolved-phase hydrocarbons remaining in the groundwater beneath the site may result in an acceptable risk.

EXCAVATION AND DISPOSAL/TREATMENT

Soil excavation is ideal when the volume of soil to be excavated is relatively small and when the excavation would not necessitate unwanted demolition of site structures.

Remedial excavation at this site would entail: 1) abandoning numerous monitoring wells; 2) demolition of numerous onsite structures; 3) excavating soil to depths of approximately 80 fbg in the area of the gasoline USTs; and 4) backfilling and compacting the excavation area.

Advantages: Excavation may reduce the time to achieve site closure by eliminating the source of petroleum hydrocarbons. Excavation is an effective remedial approach for remediation of sites with low-permeability soils.

Disadvantages: An excavation at this site would require the removal of numerous monitoring wells and the demolition of onsite structures. The excavation would require the removal of a large volume of soil (over 5,000 cubic yards) to a depth of up to 80 fbg. The contaminated soil would have to be loaded and transported to a recycling facility, thereby increasing remediation costs. A similar volume of backfill material would have to be imported to fill the excavation.

Discussion: Although the proposed site re-development activities will result in the demolition of the existing onsite structures that would have to be removed during excavation activities. Extensive shoring would be required to conduct excavation of deep hydrocarbon-affected soil present beneath the gasoline USTs (total depth of excavation would be approximately 80 fbg). Therefore, excavation is not considered to be a cost-effective remedial

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option for remediation of the deep (greater than 15 fbg) hydrocarbon affected soil at this site. However, excavation of the shallow (less than 15 fbg) hydrocarbon-affected soil at this site will be conducted as part of site demolition and site redevelopment activities.

VAPOR EXTRACTION

Volatile hydrocarbon vapors can be extracted from the soil by applying a vacuum to one or more wells. Treatment of extracted vapors may be performed through internal combustion, thermal oxidation, catalytic oxidation, or carbon adsorption vapor extraction systems. These different options are briefly discussed below:

- 1) Internal combustion engines are used to incinerate extracted vapors. Destruction efficiencies are typically greater than 95 percent. A make-up fuel, such as propane, is added before combustion, unless extracted vapor concentrations are greater than approximately 40,000 parts per million by volume (ppmv). System operation may be costly when the extracted hydrocarbon vapor concentrations are lower than approximately 10,000 ppmv.
- 2) Thermal oxidation is the most widely used method of treating extracted hydrocarbon vapors. At elevated temperatures (1,400 to 1,800°F), the molecules of hydrocarbons and oxygen have sufficient energy to react directly with each other to form carbon dioxide. A supplemental fuel is added before combustion unless extraction well vapor concentrations are on the order of a few percent by volume (>10,000 ppmv).
- 3) Non-flame thermal oxidation technology is capable of handling a maximum inlet concentration of approximately 3,400 ppmv. This technology consists of a reinforced insulated chamber filled with silica gravel. Factory-installed heating elements are distributed in the bed. Located above and below the bed are gas duct passages that allow process gas flow to be reversed through the bed. The gas flow is controlled by an automatic valve mechanism, which changes the direction of the gas flow at regular intervals typically ranging from 60 to 480 seconds. This system is not susceptible to attack by lead or other masking agents in the influent gas stream.
- 4) Catalytic oxidation may be used for remediation purposes. Extracted vapors are heated and then passed over a catalyst bed. Catalysts lower the reaction's activation energy, the energy necessary for the molecules to react. With a catalyst present, the same reaction as thermal oxidation occurs, but at a lower temperature

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(500 to 900°F) resulting in lower operating and or capital costs. Destruction efficiencies are typically greater than 95 percent. Hydrocarbon vapor concentrations greater than approximately 4,000 ppmv must be diluted to prevent a meltdown of the catalyst bed.

- 5) Activated carbon beds can be used to treat hydrocarbon vapors. This technology is economically feasible for low hydrocarbon concentrations (<200 ppmv) and low flow rates.

Advantages: This technology offers proven performance, readily available equipment and easy installation. Vapor extraction can be used to treat large volumes of hydrocarbon-affected soil at shallow or deep depths, and can be used under buildings and other locations that can not be excavated. Once installed, operation and maintenance of the VES can be performed with minimal disruption to site business operations.

Disadvantages: This method is less successful in removing hydrocarbons from low-permeability soils. Preferential airflow paths in heterogeneous soils may inhibit airflow and volatilization in low-permeability soils. Conduit trenching and equipment purchase as well as continued system operation and maintenance render this technology a high-cost option.

Discussion: Based on this review of remediation alternatives, this technology is considered to be the most viable option for remediation of the deep (greater than 15 fbg) hydrocarbon-affected soil present in the area of the gasoline USTs. The results of feasibility testing indicate high vapor flow rates and high hydrocarbon vapor concentrations.

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APPENDIX C
GENERAL FIELD PROCEDURES

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GENERAL FIELD PROCEDURES

A description of the general field procedures used during site investigation and monitoring activities is presented below. For an overview of protocol, refer to the appropriate section(s).

DRILLING AND SOIL SAMPLING

Soil borings are drilled using continuous-flight, hollow-stem augers. Borings that are not completed as monitoring wells are grouted to within 2 feet of the ground surface with volclay grout. The remaining 2 feet is filled with concrete.

Soil samples are obtained for soil description, field hydrocarbon vapor screening, and possible laboratory analysis. Soil samples are retrieved from the borings by one of two methods: 1) continuously, using a 5-foot-long, continuous-core barrel sampler advanced into the soil with the lead auger; sample tubes are driven into the core with a mallet, or 2) at 2.5- or 5-foot intervals, using a standard split-spoon sampler lined with four 1.5-inch-diameter stainless steel or brass sample inserts. The split-spoon sampler is driven approximately 18 inches beyond the lead auger with a 140-pound hammer dropped from a height of 30 inches.

For hand auger borings and hand-held, power-driven auger borings, soil samples are retrieved using a hand-driven slide hammer lined with a 1.5-inch-diameter stainless steel sample tube.

During drilling activities, soil adjacent to the laboratory sample is screened for hydrocarbon vapors using a photo-ionization detector (PID) or equivalent field instrument. For each hydrocarbon vapor screening event, a 6-inch-long by 2.5-inch-diameter sample insert is filled approximately 1/3 full with the soil sample, capped at both ends, and shaken. The probe is then inserted through a small opening in the cap, and a reading is taken after approximately 15 seconds and recorded on the boring log. The remaining soil recovered is removed from the sample insert or sampler, and described in accordance with the Unified Soil Classification System. For each sampling interval, field estimates of soil type, density/consistency, moisture, color, and grading are recorded on the boring logs.

EXCAVATION SOIL SAMPLING

Excavation soil samples are collected either by driving a stainless steel sample tube directly into freshly uncovered soil, or from the backhoe bucket by driving the sample tube into a relatively coherent and undisturbed portion of soil within the bucket. Excavated soil is temporarily stockpiled onsite. Stockpile samples are collected by shoveling below the surface of the pile and inserting a steel sample tube into the soil.

SOIL SAMPLE HANDLING

Soil sample handling follows the same basic protocol for both drilling and excavation activities. Upon retrieval, soil samples are immediately removed from the sampler, sealed with Teflon sheeting and polyurethane caps, and wrapped with hydrocarbon-free tape. Each sample is labeled with the project number, boring/well number, sample depth, geologist's initials, and date of collection. After the samples have been labeled and documented in the chain of custody record, they are placed in a cooler with ice at approximately 4 degrees Celsius (°C) prior to and during transport to a state-certified laboratory for analysis. Samples not selected for immediate analysis may be transported in a cooler with ice and archived in a frostless refrigerator at approximately 4°C for possible future testing.

MONITORING WELL INSTALLATION

Monitoring wells are constructed of 4-inch-diameter, flush-threaded Schedule 40 PVC blank and screened (0.020-inch slot size) casing. Where possible, the screened interval will extend at least 10 feet above, and 10 to 20 feet below, the top of the groundwater table. The annular space surrounding the screened casing is backfilled with No. 3 Monterey sand (filter pack) to approximately 2 feet above the top of the screened section.

During well construction, the filter pack is completed by surging with a rig-mounted surge block. A 3-foot-thick bentonite annular seal is placed above the filter pack. The remaining annular space is grouted with Portland cement and/or bentonite grout to the surface. Utility access boxes are installed slightly above grade. Locking, watertight caps are installed to prevent unauthorized access to the well, and limit infiltration of surface fluids.

FLUID LEVEL MONITORING

Fluid levels are monitored in the wells using an electronic interface probe with conductance sensors. The presence of liquid-phase hydrocarbons is verified using a hydrocarbon-reactive paste. The depth to liquid-phase hydrocarbons and water is measured relative to the well box top or top of casing. Well box or casing elevations are surveyed to within 0.02 foot relative to a county or city bench mark.

GROUNDWATER PURGING AND SAMPLING

Groundwater monitoring wells are purged and sampled in accordance with standard regulatory protocol. Typically, monitoring wells that contain no liquid-phase hydrocarbons are purged of groundwater prior to sampling so that fluids sampled are representative of fluids within the formation. Temperature, pH, and specific conductance are typically measured after each well casing volume has been removed. Purging is considered complete when these parameters vary less than 10% from the previous readings, or when four casing volumes of fluid have been removed.